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NEWS IN BRIEF

Racial set to
buy Decoa

UNLESS a counter-offer is made Racial will take over Decoa in a share exchange with no cash alternative. Agreement has been reached between the Racial and Decoa boards on terms which value Decoa at about £65 million. This is just below asset value, and the terms are widely regarded as favourable to Racial. They are five Racial shares for every three Decoa ordinary shares, and three Racial shares for every two of the non-voting "A" shares.

Racial and Decoa together should make over £80 million profits on sales of £50 million in the 1981-82 financial year.

European link

IN its first European joint venture, California minicomputer General Automation is teaming up with Matra of France. The companies will invest \$6 million in a factory in Nantes to make high technology minicomputers for use in the manufacture of multi-layer printed circuit boards for the European computer industry.

Price cuts

STORAGE Technology has cut the prices of its IBM compatible semiconductor memory systems worldwide by up to 40%. One megabyte in the UK now costs between £17,000 and £28,000 depending on the existing memory size.

Harris' new series

HARRIS Computer Systems has introduced a family of machines called the Series 800 which provide twice the power of the previous top-end Harris computer, the S500.

Although the Japanese government brought Fujitsu and Hitachi together to develop the M-series, collaboration bet-

Xerox buys maker of reading machine for blind

XEROX has bought the whole of Kurzweil Computer Products, maker of the reading machine for the blind and other products for the disabled and an all-in-one OCR machine for data entry (CW, August 23, 1979).

The small Cambridge, Massachusetts firm has been incorporated into Xerox's Information Products Group at a price of \$3.8 million, with an extra sum of up to \$8 million to be paid in 1982, according to Kurzweil's earnings.

Turnkey Systems of Amersham will probably continue to market Kurzweil's range in the UK for at least two years. Before the takeover Xerox had a 15% stake in Kurzweil. An OCR bureau using the Kurzweil Data Entry Machine has been set up in Dunstable by Ensign Graphics. Virtually any document, whether printed or typed, can be read by the machine and transferred to a customer's tape, but because it is slower than conventional equipment it is considerably more expensive.

Olivetti gives Japan a second front in Europe

OLIVETTI'S plans to re-enter the mainframe marketing business have come to fruition and the company is now offering a range of IBM-compatible mainframes with availability in March.

As expected (CW, January 3), the company has signed agreements with Hitachi of Japan and IPL Systems of Massachusetts, US. The Hitachi machines are to be called OH 5500s, with three models, the OH 5545, OH 5530 and OH 5520 covering the spectrum of the IBM 303X line. It is not certain whether all three are based on Hitachi's M-180 processor, which is available in single and dual configurations, or whether the top machine is based on the M-200F.

The IPL machines will be offered as the OC 5300 line, with one model at present, the OC 5320. This is the one marketed by Intel in Europe for a short time as the AS/7030 and claimed to offer 40% more power than the IBM 4341.

The computers will be offered in Italy, but Europe-wide marketing is planned. Sales will be handled by Olivetti Computers, the Rome-based wholly-owned subsidiary formed in September. The agreements signed do not include manufacturing rights.

Another complaint to the OFT concerns Travicom's policy of insisting that travel agents outside the London area must install a DPAS system for ticketing and accounting if they want to use the Travicom service. Dataasab sees this as restricting the agent's right to choose, but Manners said that it was necessary to make the extension of the service to the

ween the two is largely a myth, and in mainframes they are fierce competitors, each offering a full product line covering the whole IBM 370/303X spectrum.

Hitachi's alternatives to the Olivetti machines offered by Olivetti are being marketed in Europe by Siemens.

Advancing into '880,000 lost jobs'

"DOOM and gloom were the order of the day in the Commons last Friday while MPs debated the effects on employment of the silicon chip and the need for the government to provide much more leisure facilities for those apparently fated to workless lives."

Former Labour minister Denis Howell, who is also president of the white collar union Apex, forecast that 880,000 jobs would be lost by technological advance by 1983, and the only gains he envisaged were 40,000 needed to use and maintain office

Surcharge 'unfair' say travel agents

From front page Travicom was by general manager Frank Manners who said his company considered the charge to be fair, but did not say why it was made.

In its complaint to the OFT, Dataasab also points out that Computer Communications is part owned by the two big travel agents, Hogg Robinson and Thompson Travel, and that the installation of DPAS systems at rival agents could be seen to give these two companies access to privileged information.

All Travicom users must have at least one display terminal from Travicom for directly accessing airline reservation systems and there is no argument about this requirement. The complaints are all about users' freedom to choose their own systems for ticketing and remaining independent.

Provinces commercially viable. He added that the policy would be changed next year to allow agents to install non-DPAS systems. By then the cost of providing provincial agents with Travicom "would be reduced by the Post Office's Packet Switched Service."

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Computer Weekly has a circulation each week of over 50,000 including the highest fully requested circulation in the UK.

The more complex version was scored for full orchestra and could be read or copied for performance from either end by inverting the score. In this version I believe there was a minor alteration to the conventional order of the staves to take account of transposing instruments. Both versions were melodic and had concordant harmonies; the piano version was easily playable and pleasant to hear.

Having suffered over the last 15 years in a personal and collective manner from "Ameri-

canised" sales training I find your column is most refreshing in its approach to our profession.

C. J. HART

Field sales manager

BPC Business Forms, Leeds

1984 and all that . . .

THIS week's example of the strange things people say in the media about computers was sent in by T. J. Young of Waigani, Papua New Guinea, who wins £5.

Papua New Guinea's first computerised food warehouse came into operation this week. The computer system, with a storage capacity of 64,000 kilograms is believed to be the first of its kind in PNG.

Papua New Guinea Post-Courier

ISSN 0010-4787

David Binge

Ryde, Isle of Wight

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Downtime

by Chad

Perfidious Albion

THE marauding British are on the rampage, according to US stock analysts. One of their number, Clari Winslow, is being prosecuted by the US Securities and Exchange Commission for allegedly trying to get Fairchild Camera and Instrument to pay him in return for tipping them off about a proposed takeover.

This was before Fairchild was bought by Schlumberger, and several firms were eyeing the component manufacturer hungrily. Winslow is alleged to have rung up Fairchild and told executives there that a giant British electrical pro-

ducer was all ready to pounce. The Fairchild men would not like that. Winslow told them.

Why not? they replied. Because the British firm's history of acquiring companies included "purging management and operating the company in a way that would result in dismemberment of the structure of the organisation." Winslow

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told them.

Now what company do you suppose he could have meant? I am sure that any suggestion that such things go on in a company he is associated with would make Geoff very cross.

The coach in my picture needs an oilskin to protect him from the rain and spray, but why doesn't the machine?



Olympics row

HOPING against hope that the Olympics will actually take place somewhere or other, the British National Olympic Rowing Squad is busily bringing new technology into its coaching.

Strain gauges are attached to the oars and goniometers to the rowlocks and the information thus collected is transmitted by radio to the shore to be plotted out on an oscillograph.

I have a better idea. Why not have a microprocessor-controlled oarsman? It would save getting all cold, wet and exhausted, wouldn't it?

From this the coach works out how fast the boat should be going (as opposed to how fast, it is actually going). They would really like to be able to do computer analysis, but are waiting for someone to give them a computer.

From this the coach works out how fast the boat should be going (as opposed to how fast, it is actually going). They would really like to be able to do computer analysis, but are waiting for someone to give them a computer.

Unknown possibly to course presenters, the corporate goal of most DPMs has been to obtain the understanding and involvement of senior management, possibly from the first day of system implementation. It should not be necessary for corporate management to pay upwards of £500 to appreciate the trials and tribulations associated with computing. Three hours with their DP team would offer considerably more benefit than three days on an external course. At this stage, however, it must be admitted that the in-house course content.

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PAGE SIX for programmers and analysts

by Judith Morris

'As many ghastly programs written in PL/I as in Cobol'

LETTERS from as far afield as Holland have been pouring in from avid Cobol fans in response to the article by our guest writer Ian Clark, Cobol – A Time for Change (this page, January 3).

Most of their indignation seems to stem from the fact that Clark ignored many of the recent developments of Cobol, and according to J. P. Nonnkes of Shell Nederland in The Hague, he described an IBM version of Cobol that has never been standardised and is already 15 years old.

J. R. Piggott, who is a member of the BCS Cobol specialist group, asks, "Did you wait ten years to publish Mr Clark's article or did it simply take that long for Cobol manuals, and PL/I manuals for that matter, to reach him in the Middle East?"

The chairman of the BCS Cobol specialist group, John Triance, steers clear of the debate about the merits of changing from Cobol to PL/I, the language chosen by Clark to illustrate many of his points in the article. He does, however, urge anyone who is considering such a change to base their decision on the version of Cobol which will be available when the conversion is finished, rather than an out-of-date version such

as the one described by Clark.

Triance points out that ANSI Cobol, which is now used by the majority of programmers, incorporates many of the requirements that Clark has for a better language, and says:

1. String handling is possible using the STRING and UNSTRING statements.

2. Data can be declared near the procedural code by using separate compiled programs.

3. A STRING can be searched for a given character or character string by means of the INSPECT statement.

4. The date can be obtained using the ACCEPT statement.

5. Selective monitoring and tracing can be achieved by use of declaratives placed at the start of the procedure division.

Debugging lines placed throughout the program can also be activated by compile time and run time switches.

READY TRACE and EXHIBIT have never been part of standard Cobol.

The next standard, scheduled for next year, is to include further features including the INITIALISE statement, which can be used to initialise Cobol arrays, END-IF which can be used as an alternative to the full stop for terminating IF statements.

"Clark's argument about the relative power of the languages is very suspect," adds Leigh. "It ignores the fact that line of code is only written once but read many times during its life, so speed of coding is not such an important factor."

Leigh stresses the point that PL/I, for all its advantages, is still fundamentally an algorithmic language. Therefore it is excellent for coding problems which are essentially logical ones, whereas business problems are more concerned with data than with algorithms.

So the debate over the power of the business language goes on. Most of our correspondence seems to be from those in complete support of Cobol. Is there anyone who isn't? Page Six will be pleased to hear your views.

Puzzler

A	B	J	O	V	W	O	R	K
Q	C	R	O	A	D	Y	E	
G	H	T	I	L	D	U	E	

THIS brief note was sent recently to one of our secret agents. After a moment's reflection, he had no difficulty in reading it.

Can you spot the message? See page 61 for solution.

Is your job worth less than a sales representative's?

THERE is nothing quite so interesting as finding out how much other people earn. Even more fascinating is finding out how much you are supposed to earn yourself.

Thankfully, many surveys appear that can tell you roughly how much your peers are earning, even if they cast little light on why you aren't on as much.

Similar discrepancies occur in reviews such as this. A report published last year by a different company gave the national and regional averages as much higher than this year, and also quoted salaries in London, the Midlands and the North-West as being more or less the same.

Computer programmers in these same areas would be on roughly the same salary.

For a long time the BCS has been debating whether computing is a profession to be classed with law, medicine, accountancy or engineering. If programming is to come in line with the established professions one would hope the rewards would be the same.

On the other hand, if sales representatives and indeed bus conductors can earn as much if not more than programmers – why do it?

Over the next few weeks we hope to investigate the salaries of programmers and analysts in more depth. In the meantime, if anyone has any enlightening information on the subject which they feel may interest other readers, please let us know.

The most recent survey brought out by Reward Regional Surveys in conjunction with Professional and Executive Recruitment does not do much to alter their financial hopes.

According to the survey, the maximum that a 30-year-old programmer can expect to earn is £6,400, which is less than a personnel officer, less than a sales representative, less than a maintenance engineer and less than a training officer.

Salaries in the South are usually marginally higher than in the North, but then so is the cost of living, and most readers will appreciate from experience that the difference is negligible, when everything is taken into account.

Obvious differences apart, the whole question of salary raises

"Yes, there are hundreds of us who have made it in machine code and are still doing so. I have worked years and have personally trained about 200 others to handle it efficiently, who have in turn written literally thousands of machine code programs. Machine code is easy to use and to understand, fast to construct, highly efficient and in some cases essential – how do you construct a 10-microsecond monitoring loop in Cobol, for instance?"

So there is still hope for Chris and the many others like him. As Moorhead concludes, "Somewhere out there is someone who thinks that all us machine code possible survivors."

Director of Etonfield, the microcomputer and electronic systems specialists, M. Moorhead, wrote

move to. However, a systems analyst living in the Eastern Counties can earn about £1,500 a year more than one working in the North-West, whereas two computer programmers living in these same areas would be on roughly the same salary.

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OP SPOT**Engineers' hints can prove useful**

by Bernard Allen

Frequent meetings keep staff in touch

MOST engineers are only too willing to help the operators. Take the trouble to speak to them and you will learn a lot about your system hardware.

This piece of advice comes from Colin O'Keeffe, an assistant operations officer with British Airways in London, who recently picked up a useful hint in this way.

"When you see a drive struggling with a tape you simply stop the processor, access the drive through the tape controller, and start the processor again."

Qualifying his hint, O'Keeffe continues, "Whether or not the job is unaffected by the loss of data depends on its software restrictions."

"However, I don't suppose

many operators have considered using these devices for their own purposes, although the majority are simple to use, and perform a vast range of functions."

O'Keeffe points out that the controllers may be used to write tape markers or overcome read/write errors by skipping one or more blocks of data.

"It relates to tape controllers. He explains, "Probably all operators have seen their engineers testing faulty tape drives (or servos, or whatever tag the appropriate manufacturer gives them) through the tape controller."

"The importance of the loss of data, and whether the above action should have been taken in the first place, is naturally decided by the shift supervisor."

From the technical viewpoint, O'Keeffe's hint is very good. It's direct, and, by skipping the faulty blocks, can alleviate the need to recreate tapes or re-run jobs.

Colin O'Keeffe

Computer room environment

THE computer room environment is the subject of a meeting to be held by the Central London Branch of the Institute of Data Processing Management on Wednesday, February 20. For further information contact Colin Smith on 01-836 3781.

Can a new lease of life for your computer cost an arm and a leg?

Sadly, the answer is yes.

Unless, of course, you're a Digital user. Because, unlike other major manufacturers, at Digital we continue to supply our models for many years after they first appear.

Which means you can buy new versions of your old system for a fraction of the original cost.

Or for very little extra we can supply a package which includes the latest peripherals.

And for considerably less, we can add on up-to-the-minute disc and memory units to upgrade an older machine.

The man to contact for more information is Mike Molloy.

If you don't know what you stand to lose,

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Digital Equipment Corporation,
Acre Road, Reading, Berks RG2 0SU.
Telephone: (0734) 86131.



IS THIS WHAT YOU EXPECT TO LOSE WHEN YOUR COMPUTER GROWS OLD?

What is a fair rate for shift allowances?

AN operator contacted me the other week with a query about shift allowances.

At his installation the operations staff get a 33% allowance for providing 24-hour cover seven days a week. Is that a more or less standard rate for a twelve-hour pattern? he asked.

Well, the allowances do tend to vary quite a bit from one installation to the next. Much depends on the attitude of the company and just how good the union (assuming one is involved) is at negotiating on behalf of the operators.

Terry Molloy of the Banking, Insurance and Finance Union has vast experience of negotiating on the side of computer staff.

Both are considerably higher than the allowance paid at our friend's installation.

Laser imaging system

FACSIMILE reception is one of the likely application areas for a laser-based imaging system that can form a viewable 2,000-line picture measuring 10 x 8 millimetres in 12 seconds. The system is under development by Bell Laboratories at Murray Hill, New Jersey. It uses a material consisting of a transparent polyester substrate 100 microns thick with a metal film on top. The film comprises a 600 angstrom thick layer of bismuth beneath a layer of selenium of the same thickness.

event of a contractor being hired, the shift meeting enables him to be introduced to the permanent staff.

Errors. Regardless of how good or bad the team is, mistakes in the computer room are inevitable and must be accepted to a certain extent. They should be examined in an objective manner to avoid repeating them. And it goes without saying that the person responsible should be given every opportunity to speak up for himself.

Memos provide a quick and easy way of keeping the staff informed about what's going on at the site, providing that the operators take the trouble to read them. In my experience, they don't always do this.

At the smaller installation the manager can keep his six or eight operators informed by word of mouth. He may call them into his office every two weeks or so, or even stand the notice-board is a much better medium for communication between management and staff. It may be placed in the main reception area, the rest room or even the computer room itself. The operators should be encouraged to make a habit of reading it.

However, as with memos, the notice board is severely limited in that it provides one-way communication only. Messages are left by members of the upper ranks for consumption by the operators, who seldom get the chance to respond and forward their views.

And so we come to staff meetings. These tend to be frowned upon as time-wasting affairs at some installations, while at others they seem to take place almost every other day. Which is the right approach?

In my opinion, such meetings provide an excellent means for the operators and their seniors to get together and actually discuss all sorts of matters important to the smooth running of the installation.

It's important that the shift team meets in the rest room for an hour or so at the beginning of each shift rota. There is no need for the meeting to be over-formal, but it should be controlled by the shift leader to a certain extent. Discussion might centre on such matters as:

Complaints. If one of the operators feels he is getting more than his fair share of the less stimulating and technically demanding tasks, then this is the time to speak up. The rest of the shift should be encouraged to respond as it will prevent ill-feeling arising between team members.

Problems. It is important that the operators are kept up to date about such matters as staff shortages, whether they are caused by holiday, sickness or persons leaving the site. In the

turn to attend these meetings and report what happens to the rest of their colleagues.



Instructor Chris Townsend demonstrates a micro-based business system to a group of students at the Post Office's new computer school.

CII-HB plugs gap in DPS 7 range

TWO further models have been announced in CII-Honeywell Bull's DPS 7 line, filling in the gap between the Level 64/DPS 6 and approximately equivalent to a single processor Iris 80. The 7/70 under GCOS 64E is about 1.5 times a 7/60 and about 75% of a 7/80.

The new models are the DPS 7/60 and the DPS 7/70, with main processor cycle times of 210 and 160 nanoseconds respectively. Both models come with two, three or four megabytes of main memory.

Operating systems supported are GCOS 64E, Siris 8E for users of the Iris 80, and Siris 3E for users of smaller Iris machines.

No recompilation or file adjustments are necessary to run existing software under the appropriate "E" version of the operating systems. All three

operating systems are supported on the 7/60, 7/70 and 7/80 with the appropriate microcode, while the 7/82 runs only Siris 8E, since it is a dual processor machine, and Siris 8 is the only CII-HB operating system at present.

With 3,300 staff and over 70 computers and minis, the Data Processing Executive claims to carry out more training on computers than any other UK organisation. In the new centre it expects to provide 2,500 student places a year on 30 courses, covering the programming of System X exchanges as well as systems design, management, operations and programming in Corial and other languages.

Three regular courses are now being run at Harrogate. They are Basic programming on Digico computers, the Digico assembly language and an introduction to computers for customer personnel with no programming experience.

Plans for hardware or software upgrades. The operators must be informed about additions to the system, not only for their own sake but also for management's.

Let me give you an example of why this is so important. At one installation I know a new bank of disc drives was added to the system and the operators were expected to operate them during the normal course of their duties.

Problems arose because one of the drives was faulty, a fact not discovered until a few days later, with the result that several disc packs were ruined. Had the operators been told to look out for signs of trouble they might have saved the site the time and expense of recreating the lost data.

Complaints about other shift teams. Have you noticed how each shift team thinks it's the best the installation has. In truth, each has its shortcomings and these should be discussed openly and frankly.

The operators should take it in turn to attend these meetings and report what happens to the rest of their colleagues.

The result: a unique assembly of talents, engineering abilities and products. All under the banner of a parent which is one of the world's most successful semiconductor makers, has made more IBM plug-compatible computers than anyone else, and has a growth rate appreciably better than the industry average.

So when you hear of NAS, you'll know it's no newcomer but a company with 12 years' experience in CPUs, peripherals and software.

A company which is more than capable of taking on even IBM.

Not bad for a three-month-old.

In typical configuration rents for FF 125,000, £13,000, a month including software, and the 7/70 for FF 180,000, £17,000, a month. The machines are announced only in CII-HB territory.

In the US, Honeywell has repackaged its version of the CII-HB Level 64/DPS 2, 4 and 6 as a single model called the Level 64/DPS 320 (CW, January 31).

The original two models, called the 64/DPS 320 and 350 were configured to compete with IBM's 4331 and 4341; the base price for the 330 is just below that for the 320.

Memory ranges from 512K to 2 megabytes. A new release of the GCOS 64 operating system, called 0500, will be available in the fourth quarter of this year, offering a new indexed access method for creating secondary indexes, support for interactive execution of Cobol, Fortran and RPG language processors, an interactive program checkout facility, and a facility for transferring files to and from the Level 8 minicomputer.

Micro packaging technique

THE CII-Honeywell Bull DPS 7 main and input-output processors are built of current mode logic integrated circuits assembled using the micropackaging technique which CII-HB developed and Honeywell failed to implement successfully for the Level 68/65 mainframe which was eventually abandoned.

The new school was opened by Peter Benton, managing director of Post Office Telecommunications.

It has developed for bonding the chips to the substrate have proved very effective.

It is possible to remove chips from the substrate manually and effect repairs, but this is mainly done in the prototype stage. The chips for micropackaging are bought from outside suppliers.

CII-HB has licensed a Swiss company, FAS, to make and sell the machines and tools developed for micropackaging.

HOW CAN A 3-MONTH-OLD COMPANY COMPETE WITH IBM?

When the activities of Itel's computer products division were taken on by National Semiconductor, the name National Advanced Systems entered the market-place.

The result: a unique assembly of talents, engineering abilities and products. All under the banner of a parent which is one of the world's most successful semiconductor makers, has made more IBM plug-compatible computers than anyone else, and has a growth rate appreciably better than the industry average.

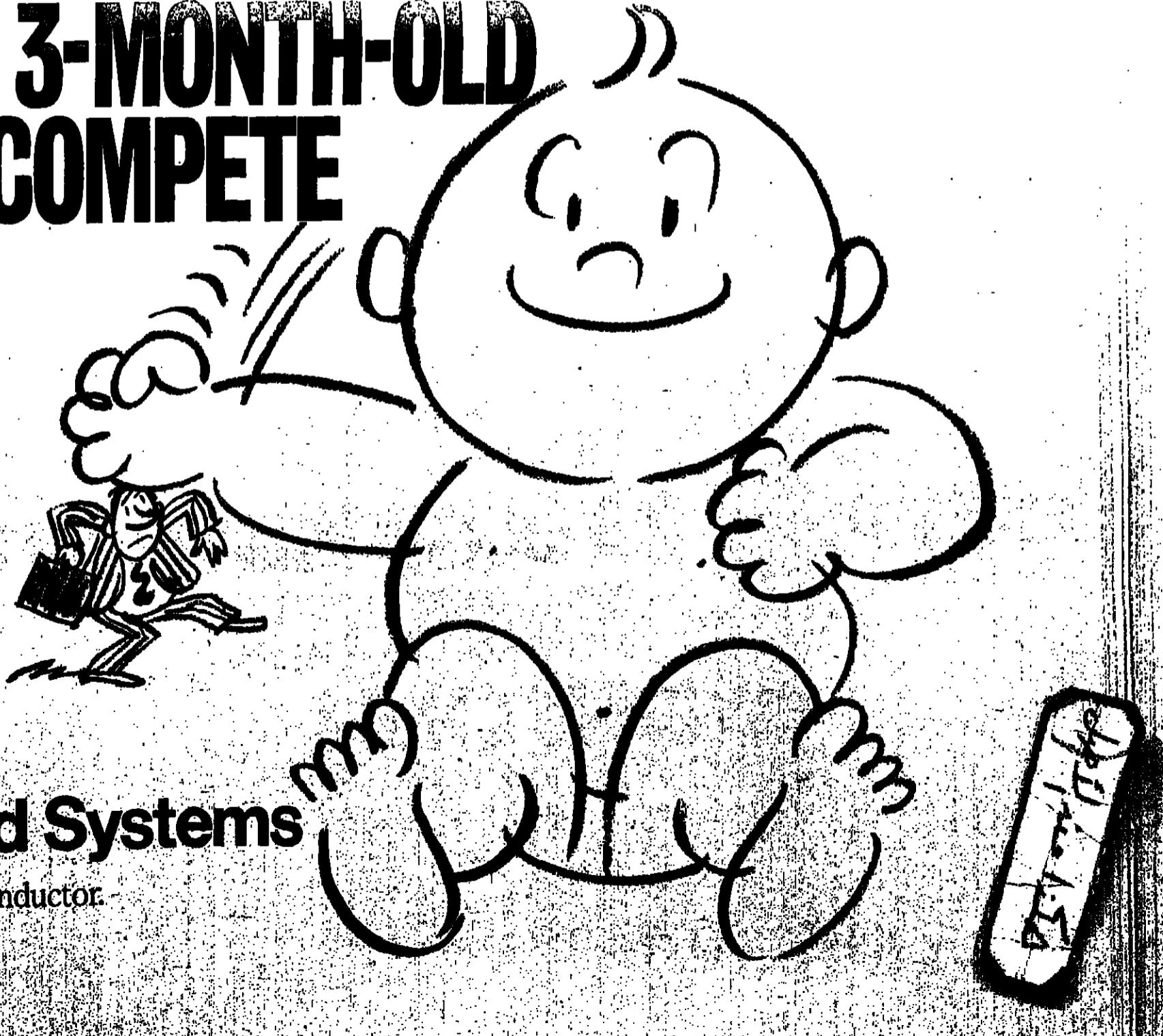
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National Advanced Systems

new
A division of National Semiconductor



MICRO NEWS

Sinclair's £100 system will test personal computer market

THE ultimate test of whether a truly personal computer market actually exists has now started, following the introduction last week of the ZX80, the new microcomputer from Clive Sinclair's Sinclair Research company, which has been developed specifically with a price of under £100 in mind.

In the end, that price has been beaten by 5p for the assembled version of the system. This will be available on a mail order basis from March, at £99.95. A kit version will be available from this month through Sinclair's associated company, Science of Cambridge, at £79.95.

To meet this price, the company has had to use a variety of novel approaches to system design, some of which mark interesting breakthroughs, while others are perhaps dubious, especially in terms of the future of the system as the basis for expansion.

The system itself is very small, measuring 9 x 7 x 2 inches, and also light, weighing only 12 ounces. Into this package is squeezed a Z80A microprocessor supplied by Nippon Electric, a large ROM containing a 4K-byte specially written Basic interpreter, the character set and monitor, and interfacing cir-

cuitry. Input is via a touch keyboard, and output is via a modulator to a standard black and white TV.

Among the interesting novelties of the system is the use of dedicated control keys on the keyboard for some Basic programming commands, such as "PRINT." This, with a newly developed but unspecified method of packing data more efficiently into memory, has helped to achieve this by dispensing with the use of dedicated controller chips for such items as the display. In the ZX80,

probably need a specifically engineered buffered interface that would effectively become a motherboard on which the system hangs.

The company has also used "old" technology to help break through the £100 price barrier. It claims that the ZX80 is faster than a Commodore Pet. This classic Von Neumann architecture, however, appears to entail several operational limitations if the system is expanded.

As Sinclair (seen below left with the ZX80) said, "We see this helping to achieve the new numeracy we are all going to require. No child should be without computer experience."

Interest, especially in one of its prime potential markets — education. Though Sinclair sees the system eventually finding its way into industry and professional use, it is the educational and home education market that is being viewed most seriously.

Given the size of the basic system, this incurs no operational penalties. In fact, Sinclair claims that the ZX80 is faster than a Commodore Pet. This classic Von Neumann architecture, however, appears to entail several operational limitations if the system is expanded.

On the basis of any cost/benefit analysis of the standard system, however, the ZX80 will no doubt attract considerable

Memory can be expanded up to 16K-bytes by the addition of external modules, through the system's single undedicated I/O port. The other port is dedicated to interfacing with an audio cassette storage system.

Another interesting aspect of the system is that, although there is only one undedicated port, it can be continued through the expansion modules so that peripheral devices can still be used. A printer, therefore, can be attached to the memory expansion system, which is itself attached to the main I/O port.

The main disadvantage of this would appear to be that the "bus" is not buffered, and any full expansion attempt would



Performa WP system now available in UK

ANOTHER US-manufactured microcomputer system, the Performa, made by Info 2000, has found its way across the Atlantic, and is being exclusively distributed in the UK by BSH Electronics of Swinton, Manchester.

Using a Zilog Z80A processor with 48K-bytes of RAM, it is being packaged as a word processing system that can provide other facilities for the small businessman.

Using dual eight-inch double-sided double density floppy disc drives offering 2.5 megabytes, a video console and an NEC word processing printer, it is combined with a word processing package called Text 2000, which runs under CP/M version 2.0.

Other software packages available include CPA 2000, which is a fully integrated accounting package.

CP/M user group

A USER group has been formed for anyone using the CP/M operating system.

At present it is being run by MML, a firm of microcomputer consultants and conference organisers. To date there are 25 members, each paying a nominal £5 a year membership fee. A quarterly newsletter is planned.

Further information can be obtained from David Parvila, Lybelle at MML, 11 Sun Street, Finsbury Square, London EC2.

With the first issue scheduled for publication this month.

Later in the year, the group

could be holding a series of

seminars on various aspects of

the CP/M system.

Further information can be

obtained from David Parvila,

Lybelle at MML, 11 Sun Street,

Finsbury Square, London EC2.

by Martin Banks

Specialist in Pet packages

A NEW software house specialising in applications packages for the Commodore Pet has been formed on the South Coast.

Called Anagram Systems, it is working in close co-operation with the Brighton-based Pet dealer, Amiga Micro Systems, and has already come up with one package (not yet formally approved by Commodore for the Pet computer).

This is the Anagram Stock Control System, which provides full screen formatted input fields, and comprehensive input data validation.

AN air of serious purpose filled most of the area of the Wembley Conference Centre, where Microsystems 80 was held last week. It was an air that impressed some, and disappointed others, for carried with it the unmistakable tinge of "business," rather than fun.

After three years, the microcomputer business is starting to become just that — a business. Not only that, but the industry is beginning to take itself seriously, and the visitors to the

show were by and large of the same intent.

This was a trend that tended to disappoint some of the more long-term members of the microcomputing fraternity — the ones that remembered the goggle-eyed wonder of the visitors to the first Microsystems, and the high degree of amazed interest and sense of fun that both visitors and exhibitors had for these wonderful new systems.

In the three years the show

has been running, those systems have changed very little. Some new ones have come in, and many of the early ones have been refined and enhanced, but many of the visitors to the show have by now seen what they have wanted to see, and had basically reached whatever purchase decisions they felt inclined to make.

This no doubt accounted for the early opinions expressed about the event by several exhibitors. The general consensus was that the level of serious inquirers being made was surprisingly high.

Comart's new division, the Byte Shop/Computerland chain of retail shops, was also present, though in a more subdued vein than previous years. Under the Comart banner, the product lines carried are to be rationalised downward from the range of 20 different systems that were previously carried. Among those to go are the Plessey minicomputer line, the South West Technical Products systems and several of the peripheral options. Mainstays of the new product line will be the Pet, Cromemco and Horizon systems, and the company is having clear-out sales at its six shops around the country of the equipment no longer to be stocked.

In the main, however, the tone of the show was subdued and serious, with the trend moving noticeably away from the idea of the exhibitors trying to sell clever boxes and towards selling total systems packages.

Another of the computer stores at the show, Isher-Woods, officially launched its new advisory service, called the Ric Hot Line (CW, January 17). With Isher-Woods centring its activities on Pet-based systems, the new Hot-Line service, inaugurated at the show, will allow members advice on both hardware and software problems on the Pet and other 8502-based systems. Membership is available for a £25 annual subscription fee.

This was perhaps most noticeable on the Commodore stand. Though the company is now poised to introduce a new version of the Pet offering 64K-bytes of RAM and a large, 80 column integral display — and is also now rumoured to have a colour version of the equipment available later this year — there was no pre-launch showing of either, as occurred last year with the 16K and 32K-byte versions.

Instead the company centred its display squarely on the field of its growing systems capability. Its stand was possibly the nearest thing yet to a software exhibition, with continuous demonstrations of its new range of applications packages. These included the stock control program, Comstock, the two versions of the Wordpro word processing package, Company, a new payroll package for up to 200 employees, and Complanner, which the company describes as the ultimate personal information tool, providing address book facilities for up to 200 names, with a diary capability.

The Series 800 offers 108K-bytes of main memory, and can cope with up to 4.8 megabytes of online floppy disc storage using 8-inch drives. Like the company's other favourite system, the Pet, the 800 comes with integral keyboard and display.

One new system that did see the light of day at the show was the ACT Series 800. This is a Minimax manufactured by Compu-Think in the States, the company that already supplies ACT with Pet-compatible floppy disc drives. The system has been taken on by ACT to extend its operations into the microcomputer field following its early endeavours with Peisot.

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Down the alley on the Comart stand, a similar trend could be

COMPUTERMARKE'80

In the Midlands?

Computermarket'80 opens at the Albany Hotel, Smallbrook Queensway, Birmingham on the 4th, 5th and 6th March between 10 am and 5 pm daily. The Albany Hotel has excellent facilities and is very conveniently located for car parks and New Street Railway and Bus Stations.

In the North West?

The Manchester venue of Computermarket'80 is the New Century Hall (at the foot of the C.I.S. building) in Corporation Street, opposite Victoria Station, close by car parks and connected by bus with the Piccadilly Station. Computermarket — North West is open 11th, 12th and 13th March 10 am to 5 pm.

In Scotland?

Regarded as Glasgow's finest hotel, the Albany in Douglas Street (on the corner of Bothwell Street) houses Computermarket'80 in Scotland. The hotel is within walking distance of the major railway stations and well provided with car parking and motorway access. Computermarket — Scotland is on 18th, 19th and 20th March between 10 am and 5 pm each day.

In London?

Biggest of all the Computermarket'80 venues is at the West Centre Hotel, Little Road, London SW6. The West Centre Hotel is a few minutes walk from West Brompton underground station and is also convenient for the Earls Court underground. Limited car parking is available at the hotel itself. For those visiting London Computermarket is open 25th, 26th and 27th March as with all venues, the exhibition is open from 10 am to 5 pm each day.

Data processing manager?

How much would a ten per cent saving on your stationery budget mean to your annual costs? There may be an exhibitor who could achieve that if the two of you met. Is your next peripheral going to be supplied on the most favourable terms? A visit to Computermarket will give you the confidence that you are doing the best for your company. Wouldn't it help if only other Managers in your company could see what it was you were talking about when describing printers/ plotters/ displays/...? Why not bring them along to Computermarket and show them what you've got? Does your chief analyst realise how software packages can be run on your hardware? Wouldn't you both benefit from a visit to Computermarket?

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Singapore to make Indian micros

INDIAN-DESIGNED microcomputers are to be built in Singapore for the Far East market.

Hindustan Computers, one of the most ambitious and fast-growing companies on the Indian microcomputer scene, has established a joint venture company, Far East Computers Ltd, to build its Abacus line of microcomputers. Hindustan Computers owns 13% of the venture, the Singapore State

Economic Development Board will have 25% and the remaining shares will be offered in a public issuing.

Shiv Nadar, managing director of Hindustan Computers, is to head the new venture, which is planned to be in full production by 1982.

Apart from Singapore, Far East Computer plans to market in Malaysia, the Philippines and Dubai. Markets in Hong Kong, Thailand, Indonesia, and several African and Middle Eastern countries are being considered.

Motorway net extended to M4 and M6

COMMUNICATIONS carrier equipment worth over £1 million is to be installed on the M4 and M6 motorways between London, Bristol and Birmingham under a contract placed with GEC Telecommunications for the fourth stage of the Department of Transport's plan to improve motorway display signals and emergency telephone links.

The 27-mile link will have repeaters every 10 miles and will join the network installed by GEC under the first three stages of the plan on the M1, M6 and M62 motorways. It is due to be in operation by the end of 1981.

Control of the signals is effected from minicomputers in each area. A contract was placed two years ago for several Ferranti Argus 700s to be added to the initial Elliott 908 system. Police at the control centres enter commands in geographical terms which are translated into codes to be sent to the displays at 50 or 200 bps. The network has been tested to 9,800 bps for possible future upgrades.

Telbservice from Siemens

SIEMENS has joined the rush by minicomputer manufacturers to rationalise the costs of their support operations by offering users an online diagnostic service. Called Telbservice, it is offered to all users of Siemens mainframes running the BS 2000 operating system from Release 4.0 onward.

The service will be offered from a hierarchical network of

Baric managing director

BARIC Computing Services has announced the appointment of Keir John Hopkins as managing director. He succeeds Peter Holland who moves to ICL to take over as director of corporate information systems.

French software houses in joint operation

FIVE French software houses have joined to form a private venture joint-type operation in the US. The five, Cdf Informatique, Eco-Automation, SLS, Scapa and Steria, will open an office in Los Angeles which will collect US market intelligence and provide

a base for support services to assist the members in marketing their software products in the US. The group will also publicise the French products available, but the individual companies will continue to handle their own selling. Other firms may join.

Pitney-Bowes buys WP firm

A SECOND step into the office of the future business has been taken by mailing machinery maker Pitney-Bowes in the takeover of Artec, which manufactures small-scale word processors in Palo Alto, California. Pitney-Bowes had earlier bought Dictaphone (CW, January 4, 1978).

Artec, which has cost Pitney-Bowes \$10 million, had a turnover of \$8 million last year. Pitney-Bowes says it is planning to invest several times the purchase price in marketing and manufacturing.

The word processors are to be sold through both Pitney-Bowes and Dictaphone dealers eventually. At present they are marketed in the UK by Data Dynamics, and it is expected that this arrangement will be left unchanged for about a year, at the end of which Pitney-Bowes may decide to sell the equipment through its own UK outlets.

Three bid for US aviation info contract

THREE US companies are competing for a \$100 million contract from the Federal Aviation Administration to design a computer system to take over flight service tasks currently handled manually. Essentially a viewdata-like information service, the system will provide pilots with weather, flight plans, landing procedures and so forth.

The computers will be installed at the FAA computer centres alongside the IBM 9020D air traffic control computers, and linked to VDUs at the flight service centres.

The design contracts have been awarded to Ford Aerospace and Communications group, \$5.6 million; E-Systems, \$3.7 million; and Logicon, \$3.6 million. Each is to design a system, and the contract for implementation is likely to be placed within 15 months. They will specify off-the-shelf computers and write the software.

The present system currently employs 5,000 people, and we estimate that it will need 12,000 by 1995, so we have to do something to automate it," an FAA spokesman in Washington told

NEWS IN BRIEF

CDC breach of copyright suit

CONTROL Data is suing two Washington consultancies for allegedly using for their own profit parts of a medical appraisal package developed under contract for use on CDC's Platelet system.

The program was to have been used to interview patients to assess their health risks, and the Health Corp and Learning Management Inc were contracted by CDC to write it. Now CDC is claiming breach of copyright.

Harris acquisition

HARRIS Corp in the US is moving into the telephone switching business with the acquisition of the Farinon Corp of San Mateo, California, a firm which includes digital PBXs in its product line. Harris is paying about \$125 million for Farinon, which has 2,100 employees.

Effects of Finniston

THE EDUCATIONAL implications of the Finniston proposals on the engineering profession are to be the subject of a conference in London on October 15 and 16 under the auspices of the Department of Education and Science. Programme information can be obtained from the IEE at Savoy Place, London WC2.

Protecting jobs

THE INVASION of Afghanistan and the subsequent threats by the US and the UK governments to bar exports of computers and computer spares have brought the Russian computer market under the spotlight. Little is widely known about the Soviet Union's computer population and their uses, so Gerald Segal's summary of the Soviet chief planner's report to the Supreme Soviet on the subject is particularly timely.

by Gerald Segal

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reorientating the system to keep pace with the Scientific-Technical Revolution (which, as Soviet leader Leonid Brezhnev recently admitted, it is failing to do).

This year sees the end of the current 10th five-year plan — a dismal end overcast by the failure to achieve the most important growth targets in the fuel-energy, chemicals and machinery industries, and in consequence a targeted growth for the year of 2%, which is the lowest since Soviet industrialisation began in the late twenties.

If, however, we make the

averaging assumption of three

computers per system (and

some Russian sources have

mentioned such a correlation in

the past) we have a total Soviet

computer stock of about 10,500,

which are likely to be relatively

old-fashioned third generation

Rjed models based on the origi-

nal IBM 360s.

Curiously, a year ago the

Soviet computer press reported

3,800 AMs in the country,

which suggests that in the past

year some must have been either

wound up due to low efficiency

or combined into larger units.

Efficiency is unquestionably a

problem.

According to Dr A. Baranov, a

consultant to the Soviet Com-

unist Party Central Commit-

tee, the third problem is the ad-

mitted inefficiency of the sys-

tem: two moves have re-

centred to overcome this

problem. At the enterprise level

a new set of enterprise perfor-

mance criteria, based upon a

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COMPANY NEWS

Glimmer of light for DG profits

ICL France is booming

DATA GENERAL'S share price on the New York stock exchange went up from \$63.5 to \$65.125 on the news that the firm's profitability in the first quarter of its current financial year, which ended December 22, was not as poor as had been feared.

At \$11,927,000, net profits were about \$200,000 up on the same period in 1978, which is less worrying than the net profit figure for the last quarter of fiscal 1979 which showed a fall of nearly 7% on the last quarter of 1978.

Data General gives several reasons for the sluggish rate of growth in its profitability at the moment. It says that a lot of money is being poured into expanding its field engineering and

systems support work-force, especially in Europe, and also incurs the cost of starting up production of the Nova 4 mini.

Two other reasons are the cuts that Data General made in the prices of its big Eclipse systems after IBM announced its low-cost 4300 series last year, and the shortage of chips which apparently has had some effect on the rate at which the company can ship systems.

ICL (London) does not report profit figures.

Memorex fourth quarter slump

A NOT unexpected profit plunge in the fourth quarter left Memorex with net profit for 1979 down 25% at \$41.9 million on turnover up 16.5% at \$37.8 million. Fourth quarter profits slumped from \$12.4 million in 1978 to \$2.2 million in 1979 on turnover up 5.6% at \$19.5 million. Pressure from IBM pricing, increased competition, production problems and increased costs were all involved, says the company.

CDC computer results soar

DESPITE a rocky fourth quarter, Control Data profits stormed ahead in 1978 as a whole, up 38% at \$124.2 million on turnover up 19% at \$3.300 million. The fourth quarter profit was a shade off at \$23.8 million, but this was attributed to lower extraordinary income than in 1978.

Computer business profits soared 71% to \$70.8 million on turnover up 22% to \$2,300 million. Outright sales led the way at 25% ahead, while rentals and services grew 19%. The balance came from the Commercial Credit financial services company, up 12% at \$677 million.

Fourth quarter profits were also hit by a change in the accounting method for leases, which are now being charged

against profits as incurred, rather than spread over a three-year period.

Control Data's turnover in the UK in 1979 was £56 million.

The company claims that its installed base of computers in France represents about 3% of the total, and grew 18% during the year to a value of FF 1,088 million (£119 million).

ICL (London) does not report profit figures.

COMMENT

THE Insec offices in London and New York are most impressive. Prime locations — a salubrious square in Lincoln Inn Fields in London, an excellently appointed suite on the whitest part of Park Avenue in New York — speak volumes about the quality and good standing of the company.

An organisation for which only the best is good enough is clearly an attractive business partner.

Backed by the British government, too. And such cultured people.

They speak of philoxenia systems. And faced with the need for a change of name from Insec Viewdata, what could be better than Argon? Readers will instantly recognise Argon as The Helper of classical Greek.

Sad to say, two heretical thoughts come to mind. True, highly successful companies like Racal boast that their employees today have at their disposal the best capital equipment money can buy — but most of the component companies in the Racal group started off not in plush premises but in sheds and Nissen huts, operating on a shoestring.

Dec reports that demand for the VAX-11/780 32-bit mini, for terminals and microcomputers was particularly strong. OEM customers leading the way.

Capital spending is being doubled this year, with new plants for semiconductors, terminals, printed circuit boards and general manufacturing being built.

As for Prestel viewdata, it is becoming painfully apparent that the UK is on the way to being an also ran in another technique it created. Leading Post Office Prestel director Roy Bright has defected to the French, and the French PTT has adopted a more determined approach to information technology.

The UK Post Office designs a system, announces the specifications and waits for the TV and terminals industry to come up with products.

The French approach is to go to three or four companies and say "We want a viewdata-type terminal; it must have screen, full keyboard and printer, and it must have a unit cost no higher than £35. We know it won't be easy, but when we have available your solutions we will give one of you an initial contract for 260,000 with more to come if it is successful."

As a result, it seems all too likely that by about 1983, there will be far more users of viewdata-type systems in France than in the UK.

INCREASED sales of second user IBM 370s were the main reason for the substantially improved turnover reported by the Atlantic Group for 1979. Turnover increased from less than £11.5 million in 1978 to more than £16.9 million last year, while profits went up from £1,053,000 to £1,164,000.

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<p

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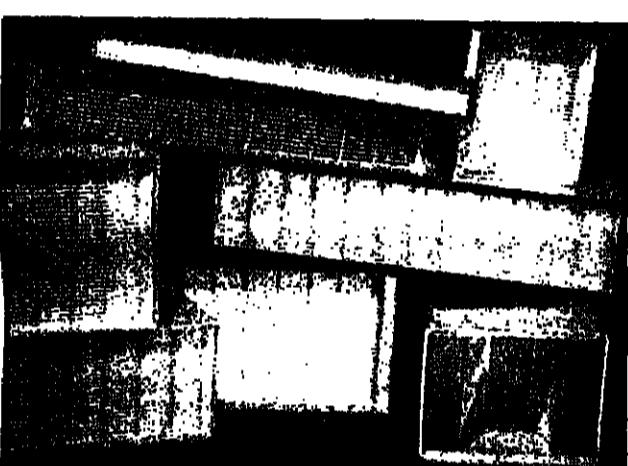
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PRODUCT NOTES

80-megabyte disc system for PDP-11s

FROM Xylogics comes the Model 610 disc system which provides up to 80 megabytes of online disc storage for any Digital Equipment PDP-11 Unibus processor and is resident on one two-sided quad board.

The controller utilises the programmable bit-slice microprocessor technique and is designed on a micro module basis to allow for future expansion to handle 4,400 bpi disc drives with a few ROM changes.

The Model 610 is compatible with DEC's RK-11 and RK-06 disc drive controllers and cartridge and comes with software support for users of DEC's multi-user time sharing system based on the Dibol interactive programming language, Dibex.

It supports up to four 2.5, 5, 10 and 20 megabyte disc drives in all combinations of removable and fixed media.

The Model 610 offers standard position verification compatible with DEC's RK-11 controller and, in addition, an optional 100% position verification. All track seek instructions contain an implicit seek command.

Separate seek command is provided with the Model 610 to facilitate overlapped seek operation.

Xylogics International Ltd (CW), Lynton House, Mill Lane, Gerrards Cross, SL9 8AY. Tel: 02813 88287.

Leaflet

A LEAFLET is available from Power Equipment which illustrates its silencer for the Post Office's Type 23B telex machine.

The Power Equipment Co Ltd (CW), Kingisbury Works, Kingbury Road, London, NW8 8UU. Tel: 01-205 0033.

Desk top calculator

DECIMO has introduced four calculators in its 1980 Series, the CS-504, the DT-720, the ES-340 and the ES-340D.

The CS-504 is a 12 digit desk top calculator with print and display. Its functions include four percentage keys, three total registers, and independent memory.

A slim-line 12 digit print and display calculator, the DT-720 has a number of switchable facilities including rounding, constant, item count, print-off.

The 10 digit models, available in print and display (ES-340D) or print only (ES-340) versions share the same specifications.

Decimo Ltd (CW), 4-18 Chobham Street, Luton, LU1 3BS. Tel: 0682 38881.

Tape formatter to LSI-11 interface

AN INTERFACE for connecting standard tape microformatters to the Q-bus of the Digital Equipment LSI-11 is now available, says Arrow Computer Systems.

Made by Distributed Logic Corp (Dilog) and designated the DQ130, the tape interface is compatible with the Pertec dual-standard microformatter and equivalents, such as the Tandberg TDF-4050. Tape speeds from 12.5 to 125 inches per second can be handled, says Arrow.

The DQ130 is contained on one quad board which plugs into a signal slot in any LSI-11 based quad system backplane. The microprocessor based coupler emulates the Digital Equipment TM11 controller and is software compatible with RT-11 and RXS-11 operating systems. This compatibility is retained up to the maximum data rate of 200K-bytes per second corresponding to 1,000 bpi at 125 ips.

Major functions performed by the DQ130 are buffering and interlocking data and status transfers between the LSI-11 bus and the formatter and generation of all control signals to the formatter such as start, stop, rewind, generate IBG/EOF. Data transfers are via the DMA facility of the LSI-11.

An automatic self-test routine is incorporated in the coupler's firmware with test result indicated by board-mounted LEDs. Other LEDs indicate DMA data transfer status and formatter data transfer status, says Arrow.

The DQ130 costs £1,000 each.

This includes diagnostic software, and substantial OEM discounts were available, said Arrow.

Arrow Computer Systems Ltd (CW), Rosemount Tower, Stafford Road, Wallington, SM6 5RW. Tel: 01-647 0862.



The Tektronix 308 Data Analyser which is based on two Fairchild bipolar random access memories.

A two-page review of some of the latest devices on the market

Parallel and serial state data analyser

FROM Tektronix comes the Data Analyser which can be used for the state and timing analysis of parallel signals, the state analysis of serial data and for the signature analysis of digital products that are designed for this method of troubleshooting.

The 308 is based on two Fairchild bipolar random access memories which can be used for both serial and parallel data. The device is pictured left.

The display memory can store up to 252 bits on each of eight channels for subsequent display on screen. The reference memory can be used to compare two separate sets of data and identify differences between them.

The reference memory also provides an automatic restarting feature. This can be useful when searching for intermittent failures — the "babysitting" mode, says Tektronix.

To capture information on multiple lines, the 308 can record on up to eight channels simultaneously. In the case of parallel data, the instrument can acquire the data either synchronously or asynchronously.

Several different triggering facilities are provided, says Tektronix. In external triggering mode, triggering could be on up to 15 channels using the optional work recogniser probe. Once data has been acquired and recorded, the 308 can display it in any one of seven state-table or timing diagram formats.

Sample rates of up to 20 megahertz are possible when examining parallel signals and the "latch" mode can be used to capture pulses as short as 5 nanoseconds.

Data set-up and hold times are 25 nanoseconds and zero respectively, says Tektronix. The threshold voltage is variable from -12 to +12 volts and a TTL threshold switch is provided.

If the application involves serial data, the 308 data acquisition can be clocked either internally or externally if the data is transmitted asynchronously. External clocking for synchronous data can be on either the rising or falling edge of the clock pulse.

Serial data analysis is possible with 5-, 6-, 7-, or 8-bit characters; odd, even or no parity; negative or positive input logic; baud rates from 50 to 9,600; with data or external triggering; and with both parity and framing error recognition.

Keys on the front panel are arranged in groups and colour coded according to function. There is also a self-test feature which comes into operation at switch-on, says Tektronix.

Tektronix (UK) Ltd, Beaverton House, PO Box 69, HRENDEN, Hert. Tel: 05827 63141.

Digital cassette recorder

AMPLICON Electronics is marketing the Model 343CV digital cassette recorder from Memodyne which can accept data in either series form (RS 232C/V24) or 20 milliamp current loop and writes it on to certified digital cassette tape.

Consisting of incremental tape transport, formatter, UART interface and function control electronics, the unit can be mounted in a panel, rack or portable case and is complete with function switches.

Operating at baud rates from 110 to 1,200, over 72,000 bytes can be stored on one 300 foot certified cassette. Power drain is said to be less than 55 millamps in standby mode and Model 343CV measures 218 x 121 x 114 millimetres (8.5 x 4.75 x 4.5 inches).

It costs £971 each and OEM discounts are available. Delivery is quoted as five weeks from receipt of order.

Amplicon Electronics Ltd (CW), Lion Mews, Hove, BN3 5RA. Tel: 0273 720716.

Eraser

THE UV-E PROM eraser uses a high intensity ultra-violet source to discharge up to 14 EPROMS simultaneously, says Microdata, who add that an eight minutes solid state time is triggered automatically by the action of closing the cabinet.

A distinctive audio tone signals the end of the exposure period which can be increased to 16 minutes via an internal switch. UK price is £97, excluding VAT.

Microdata Computer Ltd (CW), Belvedere Works, Bilton Way, Pump Lane Industrial Estate, Hayes, Middlesex. Tel: 01-848 8871.

Change of logo

S/STEMS Engineering Laboratories has changed its logo from SEL to Systems as the old logo could cause it to be confused with other concerns.

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- CCITT V24 or current loop interface
- Selectable half or full duplex
- Green phosphor display
- Plus XY cursor address and page mode facility, on model 7000C
- Single end user price from £495



Matrix Printer Model 8300

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Microprocessor-based video terminals

DATA Design Techniques has added two microprocessor-based video terminals to its range of peripherals and terminals. The units, manufactured by Televideo Inc, are designated TV1-912 and TV1-920, the latter being an enhanced version of the former.

The series utilises a 12 inch screen to accommodate 24 lines of 80 upper and lower case characters and a 12 x 10 resolution with a 7 x 10 dot matrix. Dual intensity allows for differing ambient light conditions. DDT, and operational modes include self-test, protect and block mode as well as full cursor control with cursor addressing.

A comprehensive selection of functions is standard and up to 80 storeable tab positions are provided on the 920 version. The TV1-912 has 88 keys including function keys and a numeric pad; on the TV1-920 the total there are 105 keys which include an additional 16 special function keys plus various transmission keys.

Transmission is Asynchronous at switch-select rates in the range 75 to 200 baud, full or half duplex. Interfaces available include RS 232C and TTY 20 milliamp current loop, says DDT.

The TV1-912 costs under £600, and the TV1-920 under £700. Prices include site installation and 90 days on-site warranty.

Data Design Techniques Ltd (CW), 12 Leeming Road, Borehamwood, WD6 4DU. Tel: 01-207 1717.

Vax option

SYSTEMS Industry (Europe) has announced a RH780 option, which is said to enable its 9400-RM03 disc storage emulation system to connect directly to the SBI bus of Digital Equipment's Vax 11/780. Typical cost of 268 megabytes is under £20,000, says the firm.

System Industries (Europe), System House, Guildford Road, Woking, GU22 7QQ. Tel: 04862 8077.

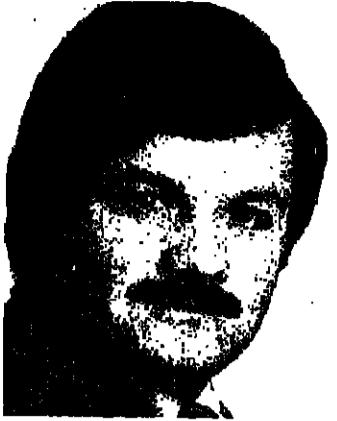
Brochure

CODEX has available a brochure highlighting its 6000 family of communications products, called Beyond the Computer. The 6000 series consists of front end processors which provide 360/370/3032 compatibility, intelligent network processors and statistical multiplexers.

Codecs Corp (CW), 20 Cabot Boulevard, Mansfield, Massachusetts, 02048, USA.

ADVANCED FILE DESIGN — Part 1

by Owen Hanson and Norman Revell



In 1977 Computer Weekly published 12 articles on Basic File Design by Owen Hanson. This successful series was later published as a Computer Weekly Handbook and proved highly popular with teachers and students concerned with the art of efficient file construction. As a sequel to the basic course Hanson and his colleague Norman Revell have now written a series dealing with more advanced techniques of file design. Aspects of this work to be covered include the optimisation of sequential, indexed and direct files, data security and integrity in batch and real time systems, and the way in which methods developed for conventional file optimisation can be applied to the tuning of databases.

These articles will be self-contained but

related to Basic File Design and readers will find it handy to have a copy available while following the advanced course. A new impression of the handbook will be available shortly at £1.00 per copy including postage and orders should be sent to the General Sales Manager, IPC Electrical Electronic Press Ltd, Dorset House, Stamford Street, London SE1 9LU. Cheques/postal orders should be made payable to Computer Weekly.

Hanson and Revell are members of the Business Systems Analysis Division of the London University Business School, London. They were part of the team that developed the Diploma in Systems Analysis and the MSc in Business Systems Analysis and Design that has been offered by the Busi-

ness School since 1973. Each spent a number of years working for IBM, and they are consultants to IBM in Eastern Europe, and also to a number of other organisations. They have lectured and presented papers in many countries, particularly on systems analysis education; file organisation, design and optimisation; and on database design.

The research aims of the team at CUBS lead by Owen Hanson include the provision of a framework of basic theory in file and database design intended to give systems designers the tools required to achieve effective data handling. This work has now been extended to include file design on a large Cromemco microcomputer with hard and floppy discs, and also on the usual mainframes.

Hanson

Sequential files on magnetic tapes

BY THE TERM "sequential files" we mean that the records in such a file are organised in a meaningful key order, usually ascending. To avoid confusion it is worth pointing out that "serial files" contain records in their order of arrival, and that their key sequence is not in any particular order. The input to a sort process is serial, while the output is sequential.

A great deal of processing is carried out using sequential files, even in these days of inquiry systems and databases. The reasons are these:

1. Many files require every record to be processed on each run. This applies to all update files and is usually true of master files such as payroll, for instance. These high hit-rate files are more efficiently processed sequentially than in any other way.

2. It is cheaper and easier to ensure the integrity of data from unintentional loss or damage if the processing mode is sequential, as against any of the other file design techniques.

3. For most purposes a sequential report is very useful as humans can easily reference information in such a report directly. Thus, when there is no particular need for an inquiry facility and the record hit-rate is high, the file designer will think first of sequential organisation.

Once it is clear that a sequential file is required, the designer has a choice of storage media. The most usual situation is that tape or discs are available. Sometimes a compromise system such as IBM's 3890 mass storage facility will be used, but this is in effect a direct access device so far as the user is concerned.

The choice is generally magnetic tape. This is because, for high hit-rates, magnetic tapes are usually more efficient. This will be examined in a future article. Also tapes are cheaper — and likely to remain so now that discs with built-in read/write heads are widely used both on microcomputers and mainframes (the IBM 3340 is an example). These Winchester technology discs are usable in poor environmental conditions, but they are far more expensive than earlier discs and have re-established the price differential between the two media.

In magnetic tape handling of sequential files, every record has to be read. Any savings that are possible come from two areas. The first is correct blocking, and the second is hit-rate. If every record is updated already, this second area is not fruitful. Often this does not apply and it is possible to batch or section the file in such a way as to increase the hit-rate.

1. Blocking. The general method described here can be used for any case a designer may have to tackle. In reading several files, a program cannot save time on data records. However, the number of inter-block gaps, or IBGs, that have to be read depends on the blocking factors for each file. The program will only have a limited amount of space for input-output areas. If only one file were in use, its records would be blocked into the largest possible blocks and so reduce the time wasted by IBGs to a minimum. For multiple files both S. J. Waters¹ and E. S. Walker² have developed equations to calculate a minimum total number of IBGs, taking into account:

- S Main storage space available for I/O areas.
- C Record length in file I.
- R The number of records in file I.
- D The number of buffers used for file I.

CALL FOR PAPERS

PAPERS are invited for presentation at Compcon 80 Fall, which takes place at the Capital Hilton Hotel, Washington DC, from September 23-25. The conference aims to explore the meaning of distributed computing and open lines of communication among researchers, users and sales people. Sponsored by the IEEE computer society, areas of interest include interfaces, standards and protocols, data communications and networking, and new public services. The Compcon committee is looking for suggestions for topics for panel sessions, which must be submitted before February 15. An informal pre-conference should be held before April 1, to David Nelson.

Compcon 80 Fall, PO Box 630, Silver Spring, MD 20001. Tel: 301 975-2860 ext 3800.

PAPERS are requested for presentation at AFCEC Informatique '80 which is to take place in Nancy, France from November 24-27. No theme has as yet been proposed so papers may deal with any technical and theoretical computer aspects. AFCEC brings together users and technicians, engineers and research workers from administration or industry. Full texts, in French, should reach AFCEC before March 15. Total length must not exceed 10 pages. Details from AFCEC, 158 Blvd Pereire, 75017 Paris. Tel: 788 2410.

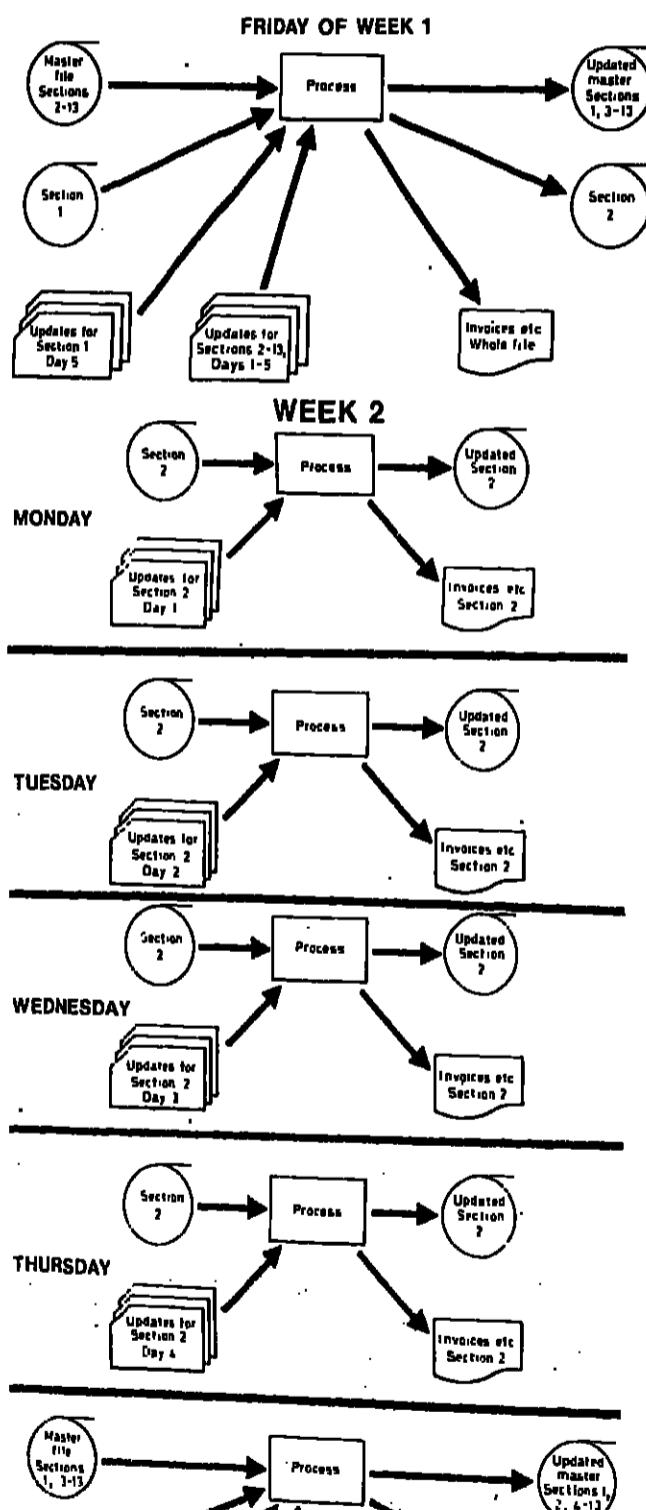


Diagram 1: Updating a sectioned file. In the example shown here the active section is processed daily, and a new active section is selected weekly. This corresponds to a 13-week cycle with daily updates of sections.

The general equation is that the optimum blocking factor for file I

$$B_i = \frac{S_i \sqrt{R_i / C_i D_i}}{\sum_{j=1}^n \sqrt{R_j / C_j D_j}}$$

Applying this to a program that updates a master file and records each transaction, with the master, on a ledger, we might have:

Master file Ledger file Transactions file

100,000 records of 250 ch
30,000 records of 300 ch
30,000 records of 25 ch

If the program has 5,000 storage positions available and each file is double buffered we get the following results for optimum blocking factors:

$$\begin{aligned} \sum_{i=1}^n \sqrt{R_i / C_i D_i} &= \sqrt{100000 \times 250 \times 2} \\ &+ \sqrt{30000 \times 300 \times 2} \\ &+ \sqrt{30000 \times 25 \times 2} \\ &= 12538.5 \end{aligned}$$

$$\begin{aligned} B_1 &= 5000 \sqrt{(100000 / 500) / 12538.5} \\ &= 5.64 \end{aligned}$$

$$\begin{aligned} B_2 &= 5000 \sqrt{(30000 / 600) / 12538.5} \\ &= 2.82 \end{aligned}$$

$$\begin{aligned} B_3 &= 5000 \sqrt{(30000 / 60) / 12538.5} \\ &= 9.77 \end{aligned}$$

If it were possible to block records into fractional parts, this solution would be optimal and would reduce the number of IBGs due to the three files to 31,440. A Fortran program to calculate optimal solutions for up to six files has been developed by Walker. As fractions of a record are not feasible, Waters suggested truncation which in this case would lead to a figure of 38,334 IBGs.

However, B. J. E. Edwards showed, in an article in The Computer Journal,³ that truncation could lead to serious errors and suggested the use of a program to search for the optimal integer, i.e. possible, solution.

The optimum in this case is to block File 1 in 5s, File 2 in 3s and File 3 in 13s. Generally the best possible arrangement can be calculated quite quickly using the theoretical optimum as a starting point. In this case extra space is given to File 2, as the figure of 2.82 is near 3. This means that 5.64 has to be reduced to 5, and the space remaining is allocated to File 3, giving a figure of 13.

2. Hit-rate. If this is already at or near 100% improvement is possible. If it is not, the designer will look for ways of increasing it.

(a) If update runs are made less frequent, then a greater proportion of master file records will be hit. This is 'efficient' in the file processing sense, but may be unacceptable to the user because of the longer wait for results. In this case a possible solution is to look at the pattern of updates.

(b) Analysis of update pattern. If the pattern of updates is either random or unpredictable, no further improvement is possible. Often updates are naturally bunched — meter readings in a single street, sales in an area that has been canvassed etc.

In this case the designer's aim is to separate the inactive sections of the file from the active. The active element is separated, updated and re-combined, with a considerable saving in total run time. The case analysed in Basic File Design reduced weekly run times from two hours 37 minutes to 41 minutes, which is typical of the results obtainable by sectioning. The process is shown in Diagram 1 taken from that book.

If the techniques described here are not applicable, or do not lead to significant improvements, the designer should consider the use of direct access storage. This will be considered in Part 2.

REFERENCES

1. Blocking Sequentially Processed Magnetic Files, by S. J. Waters, The Computer Journal, Volume 14, number 2, pages 109-112.
2. Optimisation of Tape Operations, by E. S. Walker, Software Age, August/September 1971, pages 16-17.
3. Choice of Block Sizes for Magnetic Tape Files, by B. J. E. Edwards, The Computer Journal, Volume 20, number 1, pages 10-14.

DEVELOPMENT AREAS

It's an ill wind that blows nobody any good

STAGNATION and decline rarely create the ideal conditions for stimulating new industrial development in an economy. Yet it is within those areas of the UK which have suffered most from the stresses of the post-war years that the future of our high technology industries would appear to lie.

A paradox perhaps, but one which bears out the cliché that it is an ill wind that blows nobody any good. Successive governments have realised the need to stimulate positive action in those parts of the UK which have been most severely affected by our changing role in the world economy.

With the decline in shipbuilding, the North East and North West have been severely affected: unemployment in these regions hovers with monotonous regularity at a level twice the national average.

Other traditional industries have been faced with competition that cannot be challenged effectively with obsolete equipment and small scale operation.

Without cautious intervention on the part of the government, the situation could be reached where large areas of the UK fall far behind the rest of the country.

The disturbance can be so great that areas which were hitherto surviving satisfactorily become threatened: key workers move out to the

assisted regions and there is no incentive for companies to invest in the government in power.

Assistance for industry is inevitably an emotive subject, heavily charged with political expedience. The problem is that as soon as one sector of the economy receives more favourable treatment than another an imbalance is created which spreads throughout the whole of the economy.

Restrictions are applied on industrial development in those areas where employment is acceptably high and little encouragement is required. This stick forces expansion into the problem areas, where attractive carrots are available to provide an additional incentive.

In practice, however, the

ratio for its output, the computer industry is an ideal candidate to benefit from the incentives wherever they appear most attractive.

Defining the areas which justify central government aid is not easy. Should the emphasis be on those areas which have had a history of high unemployment and social difficulty, or are resources better devoted to regions which are currently experiencing a sharp decline? Unfortunately, the decisions are political by nature: valuable votes may hang on the granting of assisted status to an area.

The first attempt at setting up assisted regions inevitably led to anomalies. Boundaries were drawn rigidly, with sharply contrasting conditions on either side of an arbitrary line.

For a company whose premises straddled a qualifying boundary, the effects were potentially catastrophic. One part of the factory complex would, in theory, have received the benefits, while there would have been no such stimulus elsewhere on the same site.

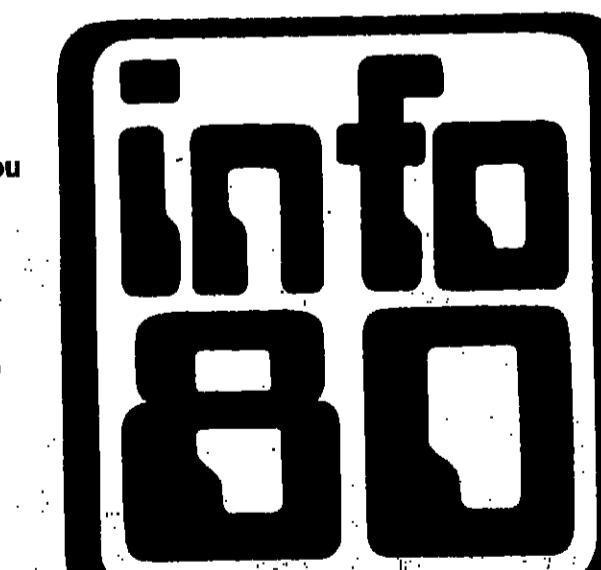
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Ideal base for European drive

DESIGNATING a locality as a Special Development Area is not the panacea for all economic ills. The granting of assisted status is only the first step towards promoting the environment in which businesses are prepared to invest capital and establish future for their company and its staff.

The intention to move into an assisted region must be a positive one, rather than a matter of necessity simply because Industrial Development Certificates are being withheld elsewhere in the country.

When Sir Keith Joseph removed many of the restrictions on IDCs, in his regional strategy last July, more responsibility was placed on the deve-

lopment organisations to promote their own region as an ideal area for expansion.

The North of England Development Council is just one of these regional bodies faced with the problem of attracting new capital into a depressed area. In terms of the locality it serves, the council is faced with an enormous task: how to inject fresh industrial life into a region which has seen the decline of its traditional activities and has been depleted further by the mass immigration of skilled workers.

The area for which the council is responsible takes in the five counties of Cleveland, Cumbria, Durham, Northumberland and Tyne and Wear. With Newcastle

the major commercial centre, this region has a population of approximately 3.25 million people.

A justification by the council for the importance of the North of England is the size and value of the market within a relatively short distance of this centre.

Inside a radius of even 100 miles of Newcastle, there is estimated to be a potential market of 18 million people.

With a large part of the development area concentrated on the East Coast the theory is that the North is an ideal base for European operations.

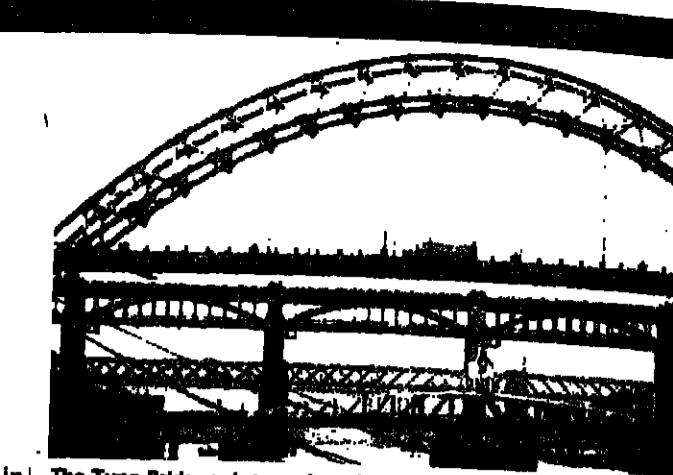
A criterion which should be applied when a company is considering a move to any assisted region is whether it would be

viable to make the transition in the absence of government assistance.

If the only advantage in moving away from an existing site is that cash grants are available, the view is a short term one, and one which could have a detrimental effect on the company's own prospects and the economic future of the staff it would be employing.

A major factor in assessing the merits of a move would be the relative labour costs in the two areas. The shortage of highly skilled staff in the North has now forced wage rates upwards, broadly in line with the national average.

But it is in the area of support staff that the North can offer



The Tyne Bridges, internationally known symbol of the enterprise of the Northern Region.

Firms must believe expansion is possible

TO THE average manager based in the Home Counties, the North West of England is probably the last place he would consider when expanding his business. For him, the North West is synonymous with high unemployment, prolonged strikes and a wholly negative attitude towards working life.

For almost 50 years now, it has been the role of the North West Industrial Development Association to counteract this unfavourable image and promote the region as one in which enterprise can thrive.

Established in 1931, the association is the oldest organisation of its type in the country. Drawing its financial support from a broad base of private and public bodies, it is effectively independent of Whitehall, although there is now limited central government assistance towards the cost of its publicity and promotional activities.

Its principal aim is to help regenerate industry in the region by attracting investment from UK companies and overseas sources. Perhaps its most important function today is as the source of information on the North West, maintaining detailed records of land available for development, transport and specialist labour.

The apparent lack of enthusiasm on the part of UK companies to set up base in the North West has not prevented over 600 overseas organisations from taking full advantage of the region's incentives.

Their experience in the region should provide the basis for a more objective assessment by UK companies.

To help promote the North West more effectively, the association recently commissioned an independent survey of almost 200 foreign-owned subsidiaries of overseas companies located there.

The object of the research was to determine the factors which were important for the companies when they decided to set up operations in the North West, and subsequently, how satisfied they were with the region.

Modernisation of traditional industries has not succeeded: the investment either came too late to prevent other regions from taking the lead, or else world markets for the product fell short of expectations.

The same has been true of the new high technology industries which were attracted to the North West at the beginning of the 1970s.

With much of the new investment concentrated on New Towns, destruction of world markets leaves even these contributions vulnerable.

The acute nature of the problem in the North West was recognised when the pattern of regional assistance was reviewed in July last year. With only minor exceptions, the Special Development Areas were unaffected by the changes.

In effect, the incentive differential between the North West and other UK regions increased marginally. Whether this is sufficient stimulus for companies to increase their investment significantly is a matter of opinion.

Respondents to the survey were asked to rate factors as advantages of the North West. While access to transport was the most highly rated, at 80%, the attitude of the labour force was ranked seventh out of the 18 factors, with 68%.

Among the factors which influence prospective investors are communications within the region. Over the past 10 years, the North West has been transformed by the extension of motorway links throughout the area. The trans-Pennine motorway (the M62), connecting with the M6 and M1, has certainly made a major contribution.

The availability of government grants and incentives was relatively less important, as a feature, ranked twelfth, at 65%. Marginally the least significant advantage, with a score of 40%, was the political stability of the region.

No region could claim that it offered only the advantages: the association readily admits that the North West has its fair share of problems. From the viewpoint of the foreign investors, the greatest difficulty was in finding suitably skilled personnel to fill their vacancies.

It is ironic that a situation can be reached in which there are

● Turn to page 28



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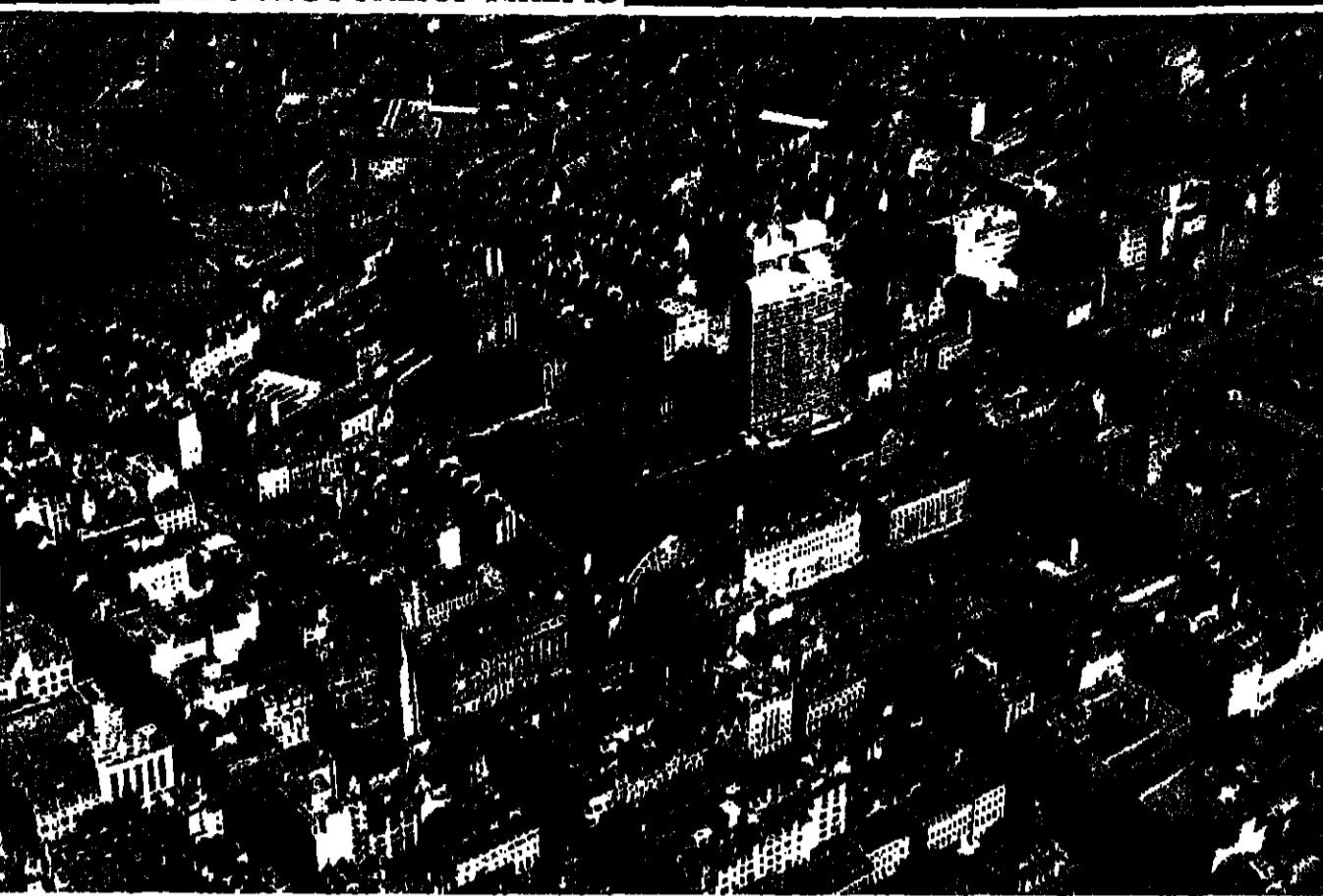
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Similar problems, different answers

ECONOMIC instability in a region can rarely be corrected within the lifetime of a single government. If the problem is more serious, and there is decay at the root of the economy, a more drastic approach is required to bring about a permanent and effective solution.

Of all regions in the UK, Scotland and Ulster are the two which require the most radical restructuring if they are ever to regain economic self-sufficiency.

In terms of declining industries and high levels of unemployment, they share the same problems, but the contrasting political environment in Scotland and Ulster calls for totally different approaches to assistance.

The features of the Scottish economy, which provided much of its industrial prosperity during the last century and the first quarter of the twentieth century, were the principal factors in its accelerated decline in between the two wars.

Scotland relied heavily on the traditional industries of steel-making, coal, shipbuilding and heavy engineering, so that the effects of the recession were particularly savage.

To help reverse this sharp decline, the first incentives were offered after the Second World War. The concept was to introduce light engineering to the region, taking advantage of the skills which survived there amongst the unemployed.

By the end of the 1950s, however, it was clear that the strategy was not working: the inertia generated by the post-war boom had not been sufficient to maintain a stimulus to the economy.

The present strategy for Scottish regeneration owes much to the Toothill Inquiry of 1981, which analysed the industrial sectors which could benefit most from the injection of capital.

Simultaneously, another electronics organisation, Controllogy Techniques, was expanding beyond the capacity of its East Kilbride factory. In this instance the agency provided a secured loan so that a factory could be built on a site provided by it on a long lease.

Any attempts on the part of future governments to provide even more favourable terms for capital grants and allowances in Scotland would be fiercely opposed by Ulster, for whom the preferential treatment meted out by Whitehall provides a vital boost to investment. In the region.

The concept of new town development is not a new one: attempts have been made, with varying degrees of success, to establish similar conurbations throughout the UK.

With this experience, five new towns have been created in Scotland since 1946. Now accounting for 5% of the total Scottish population, they have provided the nucleus for more than 2,500 organisations employing 100,000 people between them.

A significant factor has been that several overseas companies have assessed the risk, and set up their UK base in the new towns, at Cumbernauld, East Kilbride, Glenrothes, Irvine and Livingston.

Turn to page 26

Republic of Ireland's industry is at lift-off point

In the last 20 years, the computer business in the Republic of Ireland has grown from a handful of people and two computers to nearly 5,000 employed in an industry worth £70 million a year.

All calculations of the size of the Irish computer industry are only estimates, because suppliers still refuse to give out data on numbers of customers. The following estimates, however, are believed to be up-to-date:

- Number of mainframe computers: approximately 160
- Visible, record/business systems: approximately 450
- Small accounting machines: approximately 1,200
- Bureaux (including in-house): approximately 20
- The number of companies using bureaux was 450, but has probably dropped as a result of competition from minis and VRCS
- Installed value of mainframes: £55 million
- Installed value of minis, terminals and other ancillary equipment was £6 million in 1976, probably now well over £10 million
- Total annual expenditure on hardware, software, personnel and everything else: probably over £70 million
- People in the industry (other than manufacturing): between 4,000 and 5,000

The rapid recent growth has meant a lot of new skilled and professional jobs, which are particularly welcome in a country that in the past was accustomed to exporting half or more of its graduates every year.

The most exciting phase of development may be yet to come, though—the emergence of Ireland as an international centre for hardware manufacture and software creation. This is now being boosted by the microelectronic revolution and the arrival of Mostek in Dublin.

Until recently, the computer industry in Ireland has been essentially a service operation using imported equipment, and adding £10 to £12 million a year to the country's import bill.

But Ireland's energetic Industrial Development Authority, IDA, has in the last few years helped attract a number of significant manufacturing investments from overseas, making the Republic the home of more new computer manufacturing activity than any other country in Europe. To give some examples:

- Andraitx recently opened its first European factory near Dublin.
- Nixdorf is developing a £5 million manufacturing centre at Bray, near Dublin.
- Data 100 makes its remote batch terminals in Cork.
- Data Products, which has been making core memories in Ireland since 1980, also produces line printers.

And the biggest investment of all is Digital, producing its minicomputers and peripherals at Galway. DEC now employs over 1,200 data processing needs are going to expand quickly.

The country will probably have the highest rate of GNP growth among all the EEC countries this year (as it did in the past two years). It will also have the fastest growth in manufacturing output.

Who knows? The computer industry may be instrumental in finally halting Ireland's brain drain, and starting a reverse flow of skilled professional talent back across the Irish Sea.



Precision welding at the Kells, Co Meath, factory of Southborough, a British sheet metal company, one of the many firms taking advantage of the electronics industry's dramatic growth in Ireland.

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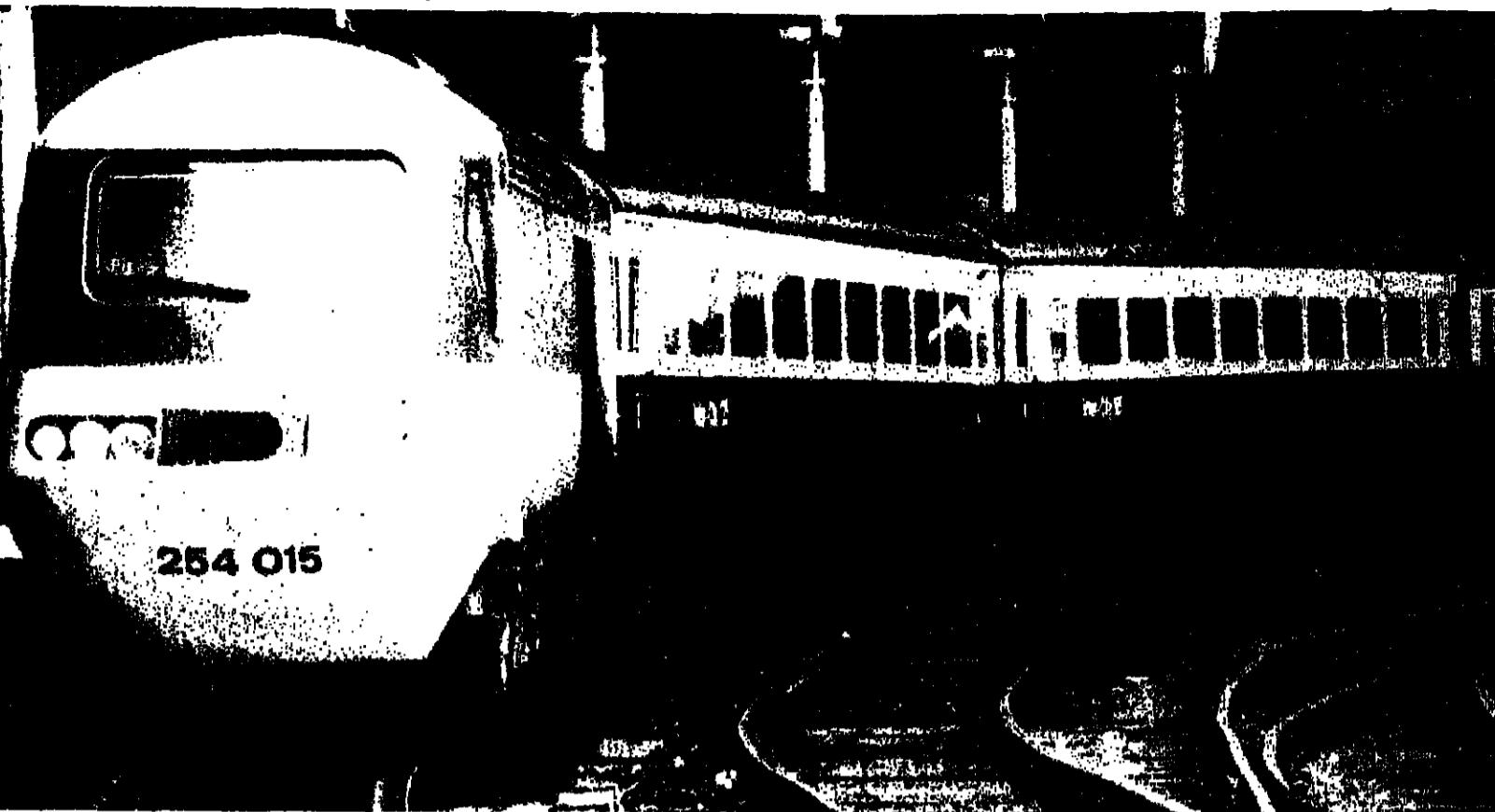
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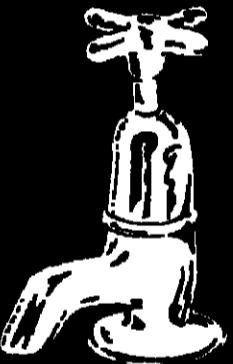
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Scotland and Ulster need new answers

From page 26

estment (and with it, the creation of job opportunities) while diversifying the basis of the region's economy.

Only by maintaining a differential over the other assisted regions of the UK can the department hope to attract new funds into this potentially high-risk area.

For capital grants, Ulster can offer between 30% and 50% of the cost, compared with 22% in the Special Development Areas on the mainland. Capital grants are independent of the number of new jobs created.

For manufacturing projects based in Ulster, additional benefits can be tailored to the needs of individual applicants; so great is the need for employment opportunities.

Assistance is fine-tuned to direct the inflow of funds to those districts where the problems are most acute. By way of tax concessions, profits earned in Ulster are treated exactly the same as on the mainland.

The size of a grant awarded does not affect the eligibility for writing down capital values against profits so that, even where the full 50% grant is payable, the company can offset the whole of the capital cost against the profits for the year (by claiming 100% first year allowance).

But to take full advantage of the tax concessions, there must have been profits generated: there is an additional stimulus to profitable operation.

So long as the political climate of Ulster remains precarious, Whitehall will support the region's economy. In practical terms, rented factory accommodation is made available through the department at subsidised rents, which are as low as 40% of those on government premises elsewhere in the UK.

For companies with growth potential, who do not want to be committed to purchasing a site which they might outgrow, this rental option is a valuable incentive.

Three schemes operated in the region are particularly relevant to the electronics and computer industries contemplating a move there.

Recognising that a shortage of skilled labour would deter these high technology industries from moving there, the department

sets up integrated work force training units (IWFUs) in areas where unemployment is unacceptably high.

The government provides a small factory, equips it, and supplies the trained instructors to handle a dozen or more workers at a time.

In practice, the success of the "small business nursery" has prompted local businessmen to take over these experimental factories as the nucleus for their own expansion programmes.

Broadly comparable with its counterpart in Scotland, the Northern Ireland Development Agency supplements the grants and incentives offered by the Department of Commerce.

A "lame duck" approach to companies in Ulster would do nothing to solve problems, so wholly commercial criteria are applied by the agency when assessing grant applications.

The agency has legal powers to acquire investments in companies, provide loans, or set up joint companies with private enterprise.

Equally important to a firm embarking on a venture in Ulster is the recruitment of management and the availability of impartial advice.

Through its own "resource bank" the agency can provide this support and is able to assist with management selection.

For the smaller scale firm, the local enterprise unit provides a comprehensive package of incentives. In line with the diversification policy, the unit has been encouraging electronics and computer companies to set up in Ulster.

It sees its role as being rather more than a catalyst which sets a company on its way, maintaining a relationship with the new firm as it develops.

This close working knowledge of the firm ensures that the most appropriate facilities are available as the need arises: there are examples on record of companies being assisted in four or more different ways by the unit; through grants, employment subsidies, offers of factory accommodation, and the funding of stocks.

Provided that Ulster can maintain its differentials over the rest of the UK, the momentum which has been slowly gathering over the past decade should enable the region to rebuild a more stable economy.

Firms must believe expansion possible

From page 26

more vacancies than people unemployed, yet relatively few of those jobs can be filled.

Confounding the popular image of the region, only one in seven of the companies in the sample identified labour relations as a problem. Indeed, only one organisation had experienced a strike.

An insight to the North West was revealed when the companies made comparisons between conditions in the UK and their home countries. The total cost of labour, specific wage costs and the cost of premises were all significantly better in the region than overseas.

Material and production costs in the UK showed some benefits, while days lost through industrial action were in line with those in the home country.

The saddest reflection on the labour force, however, was that only 8% of the companies questioned felt that productivity was higher in the UK than at home. Absenteeism fared little better.

Perhaps the most significant conclusion to be drawn from the survey was that two thirds of the firms in the sample were planning to expand their business either on an existing site, or elsewhere in North West.

A further 21% were sufficiently encouraged by their experience to expand, albeit elsewhere in the UK.

Developing a region is rather more than building roads and offering cash grants. If this is the only basis for the revival, the area becomes excessively dependent on the flow of funds from Whitehall.

A more constructive approach

Ill wind can blow somebody some good

From page 23

"Areas" and "Intermediate Areas" into the unassisted regions, the contrasts have been made less severe, with the result that assistance can be "fine-tuned" to meet the precise needs of a region.

In an attempt to reduce public spending after taking office last year, the present government made two changes to the pattern of assistance. Grants are being progressively reduced in all but the Special Development Areas and the boundaries for the assisted areas have been redrawn.

The effect has been to downgrade several localities by at least one "rank," so that areas may become less attractive to the prospective investor. The capital grant of 22% for plant, equipment and premises in a Special Development Area (SDA) stays unchanged in Sir Keith Joseph's programme.

Formerly, a Development Area offered comparable grants, but the amount of this assistance is being reduced to 15%. More stringent than this have been the revisions to the Intermediate Areas, where the 20% capital grant (which applied only to premises) is being phased out by the middle of this year.

While the cash grants are being applied more selectively, tax concessions can still be claimed at the same level irrespective of the company's location. For most types of capital investment, a full 100% of the value can be written off in the first year of use, with the right to claim a smaller fraction if profits are insufficient to take full advantage of this concession.

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This close working knowledge of the firm ensures that the most appropriate facilities are available as the need arises: there are examples on record of companies being assisted in four or more different ways by the unit; through grants, employment subsidies, offers of factory accommodation, and the funding of stocks.

Provided that Ulster can maintain its differentials over the rest of the UK, the momentum which has been slowly gathering over the past decade should enable the region to rebuild a more stable economy.

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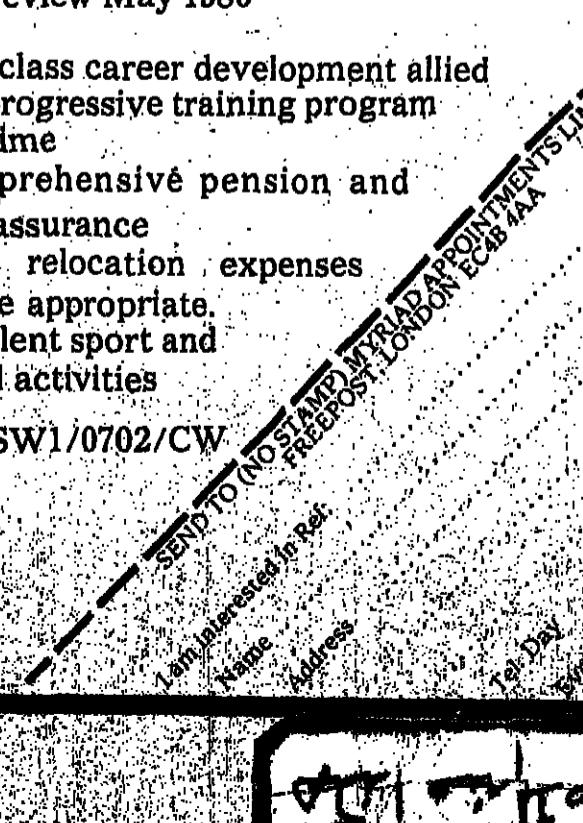
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A proven track record in sales is therefore essential and candidates must possess the potential and ambition to progress beyond a sales environment in order to undertake this highly challenging role.

Applicants should be prepared for overseas travel and full technical support will be provided by the Company whose current and future range of products are acknowledged to be at the forefront of technology.

The Company provides first-class conditions of employment and a basic salary of circa £11,000 per annum is further enhanced by an excellent health and pension scheme and the full use of a company car.

Ref: S1/0702

MYRIAD APPOINTMENTS LIMITED
30 Fleet St London EC4Y 1AA Tel 01-353 0981 24 hrs

NORTH WEST

PRESTON SYSTEMS ANALYSTS

to £7,000
+ Benefits

This company will install a 4mb 3031 in April and require two additional analysts with over two years commercial experience. Development projects include on-line and SNA techniques.

MANCHESTER ANALYST/PROGRAMMERS

to £7,000

If you can combine a COBOL programming background with some systems design experience our client would be most interested in seeing you. Database and on-line systems will be developed on large Honeywell hardware, and experience of DOS/TDS is an advantage.

MANCHESTER SYSTEMS ANALYST

£7,000 + Benefits

This company operate IBM 370 hardware with DL1 and are urgently seeking an analyst with experience of manufacturing systems. Very good prospects and benefits.

BURY ANALYST/PROGRAMMER - DIBOL

£7,000

If you have 2 years experience of DIBOL on PDP hardware our client can offer analyst/programmer involvement and an excellent career. This is an urgent requirement, and the client wishes to appoint quickly.

LIVERPOOL PROGRAMMERS

Neg. c. £5,700

This large client is seeking additional programmers with either COBOL, PL/I or IBM ASSEMBLER. If you have 2 years experience this company can offer excellent prospects and work on IBM hardware.

MERSEYSIDE COBOL PROGRAMMER

c. £5,400

This small friendly installation require an additional ICL COBOL programmer. You will work on commercial applications on ICL 2903 hardware, and should have around 2 years ICL experience.

MANCHESTER SENIOR ANALYST

to £7,500

Our client is seeking a senior analyst with manufacturing systems experience, and a COBOL programming background to work on ICL 1800 hardware.

BLACKBURN MINI ANALYST/PROGRAMMER

£7,800

Our client is seeking an analyst/programmer who combines a good academic record with programming experience gained on any mini hardware and has a forward looking approach to their work. This is a unique opportunity to become involved in sophisticated systems from inception.

MERSEYSIDE COBOL PROGRAMMERS

£6,000

Our client is seeking two young programmers with around 12 months experience. The company are upgrading to 2905 hardware, and this is an excellent opportunity if you have an ICL background.

MERSEYSIDE SENIOR PROGRAMMERS

to £6,500

This nationally renowned company have impressive development plans and require a number of staff with experience of COBOL or PL/I. You will use the latest IBM on-line and database techniques, and although preferable IBM experience is not essential as first-class training is available in all cases.

MANCHESTER SYSTEMS ANALYSTS

to £7,500

A highly successful systems house is staffing a new Manchester office. They are seeking general commercial experience covering 2 to 3 years, and a professional approach to analysis.

LIVERPOOL SYSTEMS ANALYSTS

to £7,000

This company are seeking 2 analysts with a total of 3 years experience, 1 of which should have included programming. On-line and database techniques are in use, and a knowledge of this area is desirable, as is an IBM background.

MANCHESTER COBOL PROGRAMMER

c. £5,400

This small friendly installation require an additional ICL COBOL programmer. You will work on commercial applications on ICL 2903 hardware, and should have around 2 years ICL experience.

MANCHESTER SENIOR ANALYST

to £7,500

Our client is seeking a senior analyst with manufacturing systems experience, and a COBOL programming background to work on ICL 1800 hardware.

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COMPUTER SERVICES

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GERMANY AND SWITZERLAND SYSTEMS SOFTWARE STAFF

To DM 65000

Bored with mortgage problems and inflation? Move to low tax, high standard of living Germany or Switzerland.

Our client, a substantial international systems software house is looking for experienced DOS, DOS/V, DOS/VSE systems programmers.

Vacancies exist in Munich and Zurich — full relocation expenses will be paid.

In addition they will be creating a new team based in London, giving technical support to their subsidiaries throughout the world. Travel will comprise 25% of the job.

DOS, DOS/V, DOS/VSE operating and programming experience. Senior and junior appointments, salary by negotiation.

Interested? Ring our London Office quoting ref. DS to arrange an interview.

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0001 7665 43

CHALLENGING APPOINTMENTS FOR ENGINEERS IN FREIBURG/BLACK FOREST GERMANY

A leading West German company in the development and manufacture of inertial navigation and computer systems for aircraft and ships has immediate openings for the following positions:

Test Programmers

LRU testing. Experience is required in preparing test requirements, writing test specifications in ATLAS or adopted ATLAS and the preparation and commissioning of test programs for complex digital equipment.

Card testing. Experience is required in the use of digital simulators for the preparation of test programs and the subsequent commissioning on ATE. Knowledge of the D-LASAR system or the TI 980 ATE is desirable, but not mandatory.

Applicants should have a minimum of three years' relevant experience. Knowledge of German is not essential.

Salary will be commensurate with experience and qualification. Due to the general salary level of engineering personnel in Germany, very attractive offers can be made. Benefits include, among others, 28 working days' vacation and 13 public holidays per year, assistance in finding living accommodation and reimbursement or relocation expenses for employee and family.

Interested candidates should forward a detailed résumé to —

LITEF
LITTON TECHNISCHE WERKE
Personnel Department, Postfach 774
D-7800 Freiburg i. Br., Germany

COMPUTER OPERATORS

Over £100 per week-locally

Polygram Record Operations Limited, part of the International Polygram Group of companies, manufactures and distributes records and pre-recorded tapes for marketing companies whose labels include Philips, Polydor and many others.

We now need experienced Computer Operators to help maintain our current 3 shift system which operates on the following hours: midnight - 8a.m., 8a.m. - 4p.m. and 4p.m. to midnight. You'll become involved in many interesting aspects of the computer side of the music industry and will need at least 18 months operating with DOS/V, Power/V, EPAT in order to be able to deal with our busy schedules. CICS experience would also be an advantage but is not essential.

Salary offered is up to £90 per week plus £13.25 p.w. shift allowance. Benefits are generous and include subsidised dining facilities, pension and sick pay schemes, product at discount etc.

For an early interview please contact:
Chris Wright, Personnel Department,
Polygram Record Operations,
Clyde Works, Grove Road, Romford, Essex.
Tel: 01-590 8088.

Polygram

CALMA

An American-based company, specialising in the production of computer systems for design applications. These applications cover the design of integrated circuits, printed circuit boards, printed wiring boards, etc. We are growing rapidly and have recently opened a new European customer support facility located in London, Surrey. To support this expansion we require the following additional staff:

APPLICATIONS ENGINEERS

CIRCA £8,500

Candidates should ideally possess experience in Mechanical Design, together with some software or C.A.D. exposure. Familiarity with General RISCOS would be an advantage, however acceptable experience without this experience would be considered as full. Previous experience in providing alternative travel opportunities will exist.

Conditions of employment will reflect the high calibre of people we require.

Please write or telephone in the first instance: Mr. W. Davies,

CALMA COMPANY, Motte House, 58 Eden Street, Kettering, Northants NN1 2JL. Tel: 0536 632111.

PUNCH OPERATOR

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Requires key disc/punch
text operator for IBM
System 34, or similar ex-
perience.

Salary negotiable and
similar bonus and other
benefits available.

Please contact:

K. Souterfield at
01-283 2833
or write to:

ARYA NATIONAL
SHIPPING LINES
Cottrell House
26-28 Commercial
Street
London EC2P 4EP

JBA

£5,000
- £17,000

PROGRAMMERS AND TEAM LEADERS

Remuneration depending on
location and experience

LONDON UK ABROAD

For further details contact:

Lynn Bell,
SCICON Consultancy International Limited,
20 Savile Row, London W1X 1AE,
Tel: 01-439 9376

or

Margaret Stevens,
JAMES BAKER ASSOCIATES,
International Personnel Consultants,
32 Savile Row, London W1X 1AG,
Tel: 01-439 9311



MYRIAD

TELECOMMUNICATIONS PLANNING CONSULTANT

C. LONDON

c. £11,000

Our client, a leading international organisation, wishes to appoint a telecommunications specialist who will define and direct current and future telecommunications strategy for their complex world-wide networks.

The position involves responsibility for managing the technical appraisal and evaluation of new voice, telex and data transmission services which are currently being developed. Particular emphasis will be placed upon an innovative approach to technical projects and making recommendations to senior management.

The position is ideal for a person offering a sound background in telecommunications technology and wishing to retain involvement at the forefront of development in this field. The person required will introduce a creative flair and ingenuity to the position and be capable of communicating effectively with all levels of management and maintaining a sensitive approach to organisation structure and responsibility.

This is a rare opportunity for someone to develop their career in such a role and is with an organisation accustomed to recognising and rewarding skills. A full range of company benefits are offered together with a generous relocation package where applicable.

Ref: N1/0702

MYRIAD APPOINTMENTS LIMITED
30 Fleet St London EC4Y 1AA Tel 01-353 0981 24 hrs

CANADA DATA PROCESSING PROFESSIONALS

opportunities in the province of ALBERTA

DO YOU MEET OUR REQUIREMENTS?

If you have two or more years of systems and programming experience, we invite you to consider one of our challenging positions as an Intermediate or Senior Analyst, or Project Manager in our progressive organization located in Edmonton, Alberta.

OUR ORGANIZATION

Alberta Government Services, Computing and Systems Division is the central Data Processing facility for the Alberta Government. Computing services include the operation and support of one of the largest computer centres in Western Canada. Systems services include all new development and maintenance activities associated with the challenging applications of our clients.

The Edmonton Data Centre consists of one IBM 3033 and two IBM 370-16B's under MVS/ES2. Included is a network of more than 700 terminals throughout the province. Software includes COBOL, TSO, Mark IV, Librarian, CICS, TOTAL, Environ I, VTAM, and Roscoe.

OUR OPPORTUNITIES

Our career positions offer successful candidates the opportunity of advancement and professional growth in a challenging and stimulating environment. Commencing salaries will be dependent upon experience, benefits include contributory pension, life insurance and medical schemes.

Relocation assistance includes air fare to Alberta for successful candidates and their families together with various settling-in allowances.

NOTE: In addition to the above positions, candidates will be considered for data processing positions in other Departments of the Alberta Government.

Please send resumes by February 22nd to:

W. M. Harvey
Alberta Government Services
c/o Manpower Mobility Offices
Government of Alberta
47 Upper Grosvenor Street
LONDON W1X 9PG



Opportunities for Operators

ALWAYS RELY ON KNIGHTS FOR
THE BEST MOVES

June Mogg is here to give advice and keep you in touch with a variety of permanent opportunities. OR if you have a minimum of 2½ years' operating experience and contracting is your business, then Jane Asbury, Rachel Martin or Sharn Poll can give you an up-to-date list of immediate contracts and details of those still in the pipeline 01-491 4706.

SHIFT LEADER MIDDX
IBM 4331 to be installed mid-March. Excellent opportunity for DOS VS POWER VS op. Initially to work days, progressing to 2 shifts next year. Very good prospects.

SALARY: £6,600 + s/neg.

TRAINEE EC2
Golden opportunity for smart, intelligent and enthusiastic young person. Company will train on mini computer. Hrs. 11 a.m.-7 p.m.

SALARY: £4,800 neg.

SENIOR OPERATOR EC1
Univac 90/30 installation using OS3, 2 shift system. Excellent company benefits. Very good prospects for the right person.

SALARY: £8,625 + neg.

JUNIOR OPERATOR EC3
ICL 2903/4 site operating 2 shift system. Good promotional opportunities with company perks making an attractive package.

SALARY: £4,800 +

MAKE YOUR WINNING MOVE

Opportunities for Analysts & Programmers

U.K. CONTRACTS

IBM PC + CICS/DC1
IBM IMS/DB/DC COBOL
IBM COBOL + CICS
IBM DOS SYS PROG
IBM COBOL + MVS
HONEYWELL 682 + COBOL
BURROUGHS 880 COBOL
ICL COBOL VME/B + IDMS
ICL ANAL/PROG COBOL VME/B
COBOL PROGRAMMER
HP 98/46 + BASIC
DG NOVA + BASIC
HONEYWELL FORTRAN
HONEYWELL 6000 + COBOL

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TOP CONTRACTS - TOP RATES IMS COBOL DB/DC Programmers and Programmer/ Analyst

To work in Kent and Holland
HOLLAND - Ideal first-time contract. A minimum of 12 months' duration. Good DB or DC essential for development project.

KENT - Also very good first-time contract. Initial 3 months' duration. Easily commutable from Charing Cross.

The above requirements are current and future, so if you are immediately available or on one-month's notice, call Neil Williams or Colin Cherry on 01-491 4706 (daytime) or 01-408 0280 (evenings).

IBM OS + CICS? Top Salary + Expenses S. Yorkshire

Immediate + future contracts for COBOL or ASSEMBLER Programmers with CICS experience under OS. Please CONTACT NEIL WILLIAMS FOR DETAILS.

ICL CONTRACTS LEEDS, LONDON & THE SOUTH

First-class opportunities exist for contract staff with sound ICL 2900 experience.
ANALYST/PROGRAMMER
PROGRAMMERS experienced in COBOL VME/B and/or IDMS should contact Richard Keluziński or Denise Fleming now.

For further details of the above vacancies and other permanent opportunities phone June Mogg.

Knight

Phone anytime or for an application form leave your name and address without answering service.
Knight Computer Services Ltd.,
14 Old Park Lane, London W1Y 4NL

01-491 4706

OPEN 24 HOURS 01-491 4706

Sales Manager

Birmingham to £10,000 + bonus + car

This outstanding opportunity has arisen following the establishment of a permanent, regional office by a fast expanding mini computer and software house. With proven equipment and recognised client contacts the new operation is destined to achieve exceptionally good results and the manager appointed must have the capacity to undertake the resultant responsibilities. At least two years' experience in selling mini-computers is essential and the ability to motivate and manage an aggressive sales team is also necessary. In addition to the high base salary, high bonuses on team performance, an attractive personal commission and a two to four motor car, make this a most rewarding challenge. Reference 4/1198.CW.

Sales Representatives

Birmingham based £8,250 + commission + car

Dramatic expansion of our client's software and mini-computer sales activities in the Midlands area has resulted in the creation of this rewarding challenge. The company is established in other parts of the United Kingdom and the new Birmingham office will take over current enquiries and be in a strong position to maximise business levels with the help of excellent support facilities. A generous commission based on 2½% to an annual quota of £160,000 and 5% thereafter, could double basic salary. If you feel that you are capable of selling mini-computer systems and have previous relevant experience then this is the opportunity you have been waiting for. Reference 4/1197.CW.

Please telephone 021-622 3838 at any time for an application form or send full career and personal details to John L. Overton, F.C.A., M.E.C.I., Overton Management Selection Limited, Monaco House, Bristol Street, Birmingham B5 7AS, quoting the appropriate reference number.

Applications are welcomed from men and women.
OVERTON MANAGEMENT SELECTION

JBA

OVERSEAS

Database Design in Benelux

Salaries neg. to £18,000 + Car + Benefits

Our client has established one of the foremost specialist Database/T.P. Consultancies in the U.K., and is set to do the same in Holland and Belgium. They already have an office in Amsterdam and are running several projects for Dutch clients at this moment. The plans are to expand this area by opening an office in Belgium, where the company already has one project about to get underway, and to continue penetration of the Dutch market. Applications are invited from candidates who have design experience of at least one of the CODASYL dbms systems - e.g. DMS 1100, TOTAL etc., who wish to enter the Consultancy field - if not already working for a Consultancy - and who are keen to live and work in one of the Benelux countries. Full relocation expenses will naturally be provided, plus substantial large company benefits such as company car etc. Relocation back to the U.K. in the medium term - to work for the U.K. based company - is not ruled out.

Contact: Andy Wright

OEM Market Manager

Amsterdam £65,000 - £75,000

A large international company, famous for a product range of high quality technical systems, are now seeking to expand and improve their penetration into the OEM market place. This position will involve marketing responsibility for the OEM customer base in a selected market segment. Candidates should have a demonstrated record of sales or marketing success in the computer/terminal industry and a good knowledge of display technologies. A background or education in electronics, initiative, and a business orientated attitude are essential. Reasonable amounts of travel in Europe will be required.

Contact: Mike Creamer

Customer Support Engineers

Italy (Milan) Nett: £8,000 - £10,000 plus complete relocation

Our client requires trained and experienced Support Engineers to assist in the preparation of complete installation, maintenance and repair documentation for an impressive range of mini-computer systems and associated data comms networks.

Candidates must be reasonably articulate and have a flair for communicating on technical subjects, particularly in the written word. Wonderful permanent job opportunity with excellent working conditions and career prospects.

Contact: Mike Creamer

Level 64 Systems Programmer

c. £18,500 (nett)

North Holland Long term assignment for an extremely experienced Honeywell Level 64 Systems Programmer, with team leading ability and problem solving skills. The work involves implementation of a whole RT system and comprises system optimisation, software diagnostic testing and ensuring thorough efficiency. An early start date is extremely important.

Contact: Mike Creamer

X25 Implementation

S. Germany Salaries to DM 90,000

A new communications group is to be established in Germany, by one of Europe's leading Consultancies. To date, the company has specialised in Database/T.P. projects and has scored major successes in the field of innovative and effective design. If you have X25 or similar software experience, and would relish the challenge of developing a new European group... Contact: Andy Wright

Designers/Programmers

Middle East £16,000 - £24,000

Applications are invited from qualified technical staff, who wish to work in the Middle East. Our client is one of the foremost Systems Consultancies in the U.K. which will provide long-term career progression within the company to Senior Management and Technical Consultancy levels. Immediate assignments to the company's Middle Eastern branch are, however, available to suitable candidates. Tax-free salaries and benefits are on offer, plus free accommodation and a company car per employee. Ideal experience would be on large machines, with strong preference given to candidates with dbms design and/or programming experience.

Contact: Andy Wright

JAMES BAKER ASSOCIATES,
International Personnel Consultants,
32 Savile Row, London W1.
Tel: 01-439 9311

JBA

MORTGAGE SUBSIDY PLUS RE-LOCATION Senior Programmers

Hampshire up to £7,500 + many benefits
Our Hampshire client, undertaking advanced development work on a large real-time database system, now need to strengthen their team on this project with additional senior staff. The system is being built around a powerful Burroughs B6800 machine and incorporates a DMS 2 database with a multi-terminal real-time network. Candidates must be mature, senior individuals with several years programming experience on real-time and/or database development projects. Leadership qualities and a natural ability to readily conform to strict standards will be sought.
Contact: Mike Cremer

Technical Applications

Berkshire neg. to £9,500
This small but extremely well-known and highly regarded systems and software house urgently requires technical applications specialists with in-depth experience of developing complex systems. Since unique software needs special creative skills, design and implementation experience at this level is also very important. In-house access is provided to a variety of machines - INTEL 8080, P100L, PRIME 350, D.G. NOVA etc., indicating that the majority of development work is carried out at the company's HQ. Occasional travel will be required, with opportunities to spend short periods in Europe. An up-market salary and benefits package is offered.
Contact: Margaret Stevens

Project Leaders

Cheltenham c. £9,000
The company are market leaders in minicomputer-based technology for the printing industry worldwide. An in-house computer facility is now planned. This will provide a unique ground-floor opportunity for experienced DP professionals. Candidates will have a minimum of five years in computing, which should include substantial systems analysis experience. Financial, commercial or production control experience is essential - the emphasis is on applications knowledge rather than a specific hardware or software background. Systems Analysts and a Chief Programmer are also required - first class benefits package includes relocation assistance where appropriate.
Contact: Bernard Kiernan

Operations Controller

Bracknell neg. c. £8,000 +
An Operations Controller is required to control and co-ordinate the efficient running of a worldwide network of units - covering the U.K., U.S.A. and Far East - supporting a highly successful British Air Freight Forwarding company's operations. Candidates must have mini-computer operations experience, coupled with the ability to program in BASIC or DASHARE. Considerable liaison with the overseas sites can be expected, and the appointee can also look forward to some involvement in the systems work. Excellent opportunity, with good career prospects - including overseas travel - and large company benefits.
Contact: Andy Wright

PASCAL Programmer

West of England c. £7,000
Our clients developing a number of commercial systems on microprocessors and has a vacancy for a PASCAL programmer with at least three years experience in data processing. Candidates must be keen and enthusiastic to work on micros and have spent the last year using PASCAL. Salary is negotiable according to experience.
Contact: Jim Baker

Analyst/Programmer

Surry c. £7,000
Our client, a large international organisation, has immediate vacancies for Analyst/Programmers to join the commercial development teams. Applicants should have at least three years ANS COBOL programming experience on IBM equipment and have had some involvement with systems design, preferably in accounting, general commercial or database applications. This is an exciting opportunity to work on new IBM hardware with above average fringe benefits.
Contact: Jim Baker

Junior Systems Programmers

München c. DM 60,000 p.a.
Programmers with a background of IBM operating systems software maintenance and generation are required to be trained in new Operating System Software development techniques. The company is a major European manufacturer, with developments currently being carried out in virtually every area of software. Excellent opportunities - candidates need only have 12 months plus experience.
Contact: Andy Wright

JAMES BAKER ASSOCIATES,
International Personnel Consultants,
32 Savile Row, London W1.
Tel: 01-439 9311.

Hardware Sales Consultant in Computer Aided Engineering Cambridge based

Colour Graphics, Memory Systems, Micro-Processors

Industrial interest in the application of computers and micro-processors in production control, instrumentation and computer aided engineering is growing rapidly. It is the task of CADCENTRE to help our clients make better use of their resources.

It is an exaggeration to say that a revolution is taking place in these fields - and you could help to shape it.

CADCENTRE is staffed by some of Europe's leading practitioners in the development of advanced engineering software and hardware systems.

The successful candidate will have a good knowledge of state-of-the-art hardware system technology including micro-processors. You should be able to demonstrate a successful career in selling hardware systems and products over a two to three year period plus contract negotiation experience.

You will be experienced in hardware system development and have demonstrated a capability in assessing the work involved in building complex systems against customer specifications. A background in computer graphics or computer memory systems would also be of advantage.

Amongst other hardware products of CADCENTRE you will be selling the Advanced Graphics Display Terminal which handles complex colour images used in a variety of applications within industries such as aerospace, fashion industry, and video animation. You will work closely with our Profit Centre Managers to achieve revenue targets against product and system development sales.

The ability to write and present clearly argued proposals, often to very senior client management, is naturally essential. We would expect candidates to be in their early thirties.

Please write with career details to Norman Sandland, Marketing Controller, Computer Aided Design Centre, Madingley Road, Cambridge CB3 0HB; quoting reference CW1612, or you can talk it over with the Hardware Manager, Fred Chiles, on Cambridge (0223) 63125.

 Computer Aided Design Centre

A location to fit the bill with Eastern Gas

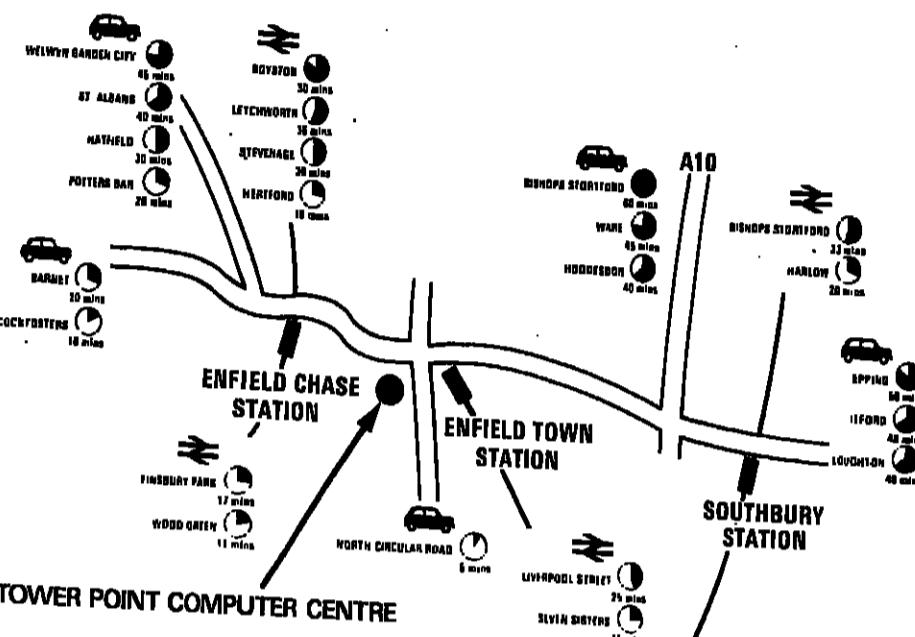
Just 25 minutes from Central London, Enfield Town centre with quick and easy access to a more civilised rural environment.

The Enfield area offers an impressive list of amenities including golf courses, sports centres and swimming pools plus a good variety of reasonably-priced residential accommodation.

Within an hour's drive can be found many attractive towns and villages such as Hertford with its Elizabethan castle or the Cathedral City of St Albans, one of Britain's largest Roman settlements.

Also within easy reach lie the Chiltern Hills or Epping Forest with The East Anglian Fens and Norfolk Broads farther afield.

Additionally, a generous relocation package brings London career prospects to those who wish to maintain a 'rural' quality of life.



£7948-£9105

SENIOR ANALYSTS

A proven record of systems development and implementation plus some experience in a supervisory role, are the essential requirements for these positions.

Successful candidates will be assigned to one of 6 independently-operating Project Groups each of which are responsible for servicing the computing needs of a particular User Directorate.

The management of a Project Group would be the next career move available to Senior Analysts.

TEAM LEADERS

£7948-£9105

Programming Team Leaders are responsible for the control of all programming activities within a Project Group.

The duties of this position include recruitment, training, staff appraisal, quality control and programming of the more complex routines.

Typical team size is 6 programmers and applicants should therefore have some supervisory experience in addition to a solid technical background.

PROGRAMMERS

£5061-£7722

One year's good COBOL experience (any machine) could qualify you for one of these superb career opportunities.

Working within a small-team environment, programmers will enjoy total systems involvement while gaining experience on the latest software products including, VME/B, MAC on-line program development and Data Dictionary.

Additionally, there will be extensive opportunities to work on SCL, low-level languages and intelligent terminals.

£7316-£8405

ANALYSTS

Systems Analysts will enjoy full feasibility-to-implementation responsibility for systems development within one of the 6 Project Groups whose particular areas of responsibility include finance, marketing, engineering, transport, supply and personnel.

Analysts will also have extensive contact with users throughout the East Anglia area and it is therefore essential that applicants should be self-motivating individuals capable of working under minimum supervision.

SENIOR PROGRAMMERS £7316-£8405

Senior Programmers will generally control a small 2/3-strong programming team working on a particular system within a Project Group.

In addition to their supervisory duties, Senior Programmers will be heavily involved in the creative areas of detailed program design and suite testing.

This is a responsible and challenging role for which at least 3 years' solid COBOL programming experience is required.

OPERATORS

£5142-£6878 (inc. shift allowance)

An outstanding opportunity to gain experience within a multi-machine environment which includes ICL 2972, ICL 1900 and IBM 360 hardware.

Successful candidates will work on a 3-shift basis and will be considered for promotion to the position of Senior Operator (currently earning up to £7,500) once they become familiar with the work of the installation.

Previous experience of either ICL 1900 or large ICL 2900 machines is required for these positions.

Systems Engineers

WE'RE COMMITTED TO INVESTMENT IN A MICRO-BASED FUTURE-JOIN US.

Cadbury Schweppes are committed to a major investment in advanced technology to support their international brands. We're setting up all the micro-based control systems we need to increase our efficiency, to improve our cost-effectiveness, and to support our entry into new European and North American markets. This means that we're also in the market for highly qualified Systems Engineers - men and women who can join us initially in Birmingham and subsequently take advantage of opportunities in London, the South West or overseas.

To join the leaders in confectionery and soft drinks at this crucial stage of strategic expenditure and development, you should be able to play an important role in the area of industrial process control and data acquisition systems. With upwards of five years' industrial experience, you'll be qualified (degree/HNC minimum) in Electronic/Electrical Engineering or a related discipline and with some useful knowledge of micro-based control systems.

Salaries are negotiable and will not be a limiting factor in attracting the right people, benefits are all those expected of an international organisation, and if you can appear on our advances you can count on good prospects yourself!



Cadbury Schweppes

For further information, please write with brief career details to: Mrs. P.M. Carvosso, International Manpower Department, Cadbury Schweppes Limited, 1-10 Connaught Place, London W2 2EX.

★ 1900 & 2960 OPS ★

If you have got 18 months plus on G2, VME/B or DME/84 then call us now! Vacancies in London and Middlesex. Contract 2904 OP for Middlesex - 2 yrs. + exp. on Exec. - 2 yrs. - urgent. Phone Geoff or John on 01-381 8888/3350 now.

ANALYST/ ANALYST PROGRAMMER

£8600-£8250 p.a. ESSEX

To help design and develop new systems at our well-known Electrical and Electronics Company at HAINAUT.

Please hear more on 01-409 1021
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Box number replies should be addressed to:
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c/o Computer Weekly
Bartons House
Bartons Street
London SE1 8LU

MERCURY DATA SYSTEMS

Requires first class field service support engineer (management potential). Salary circ. £10,000 p.a. negotiable plus car for work in superior mini system. Training will be given in the USA. Home base will be West London.

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01-839 3351

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Please send me your Eastern Gas Information Package

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Telephone
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Data Processing Staff Consultants

NORTH WEST BIRMINGHAM

**CHIEF
PROGRAMMER**
£7250

**OPERATIONS
MANAGER**
£7000

ICL 2956/10

OUR CLIENT, PART OF A MAJOR MANUFACTURING GROUP, HAS SUCCESSFULLY INTRODUCED NEW HARDWARE INTO ITS ORGANISATION AND NOW REQUIRES ADDITIONAL EXPERIENCED CANDIDATES FOR THIS CHALLENGING ENVIRONMENT. CONSIDERABLE DEVELOPMENT WORK IS PLANNED AND A RANGE OF ON-LINE SYSTEMS IS BEING IMPLEMENTED TO MEET COMPANY REQUIREMENTS.

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CONTACT: PETER BOWEN - QUOTING REF. C1013

PHONE: CODSALL (09074) 4896 EVENINGS
OR WEEKENDS

WRITE: BLACKWOOD ASSOCIATES,
FREEPOST,
BIRMINGHAM B2 4BR

WALK IN: ANYTIME BETWEEN 9.00 and 5.30

**Blackwood Associates
Recruitment Consultants**

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Telephone: 021-233 2921 (24 hr. service)

A Member of the CPS Group of Companies.

MYRIAD

**COULD YOU BE A
RECRUITMENT
CONSULTANT?**

LONDON

£7,500-£12,000

If you are interested in recruitment but do not have the necessary experience Myriad may be able to give you the opportunity to train as a Recruitment Consultant.

As one of the major companies in our field with a well-established professional reputation, we have both the resources and expertise to train you in the skills needed to carry out this challenging and rewarding work.

You must have a background in the computer industry, such as programming, analysis or any sales-oriented position. Without this essential grounding you could not be expected to give career advice to applicants or advise clients in major recruitment assignments. Under 35 you should possess the potential to succeed in highly sales-oriented situations in which you will have the freedom to work very much on your own initiative.

The wide range of activities encompassed by the work will undoubtedly surprise you. You will also be interested in your training and career development. To find out the answers and much more about the varied and interesting life as a recruitment consultant, contact us to arrange an informal discussion and we will also tell you about the outstanding long-term career opportunities available.

AW1/0702

MYRIAD APPOINTMENTS LIMITED
30 Fleet St London EC4Y 1AA Tel 01-353 0981 24 hrs



HOUSE OF FRASER COMPUTER SERVICES

(HOUSE OF FRASER LTD.)
THE FRASER CENTRE, FARADAY ROAD
DORCAN INDUSTRIAL ESTATE, SWINDON SN3 5HS

WANTED

Programmers to train, if necessary, as Mini Analyst / Programmers

SALARY

Up to £6000.

LOCATION

Home base will be new Fraser Centre computer complex on the outskirts of Swindon.

THE JOB

You will be joining a team of mini Programmer/Analysts set up to support and develop applications on all mini-computers in the House of Fraser organisation throughout the U.K. This means that in a short time you could be working on Data General, Redifon, Ventek and System 10 equipment.

WHAT WE WANT FROM YOU

- (i) Not less than 1 year's programming experience.
- (ii) An ability to communicate easily with both User and D.P. Management.
- (iii) Programming adaptability.
- (iv) A genuine enthusiasm for your profession.

WE GIVE TO YOU

- (i) Financial help in relocation.
- (ii) Training on Basic, Database, Assembler, Redifon, Data Communications and anything else you need to do the job.
- (iii) A staff shopping card that entitles you to generous discounts at all House of Fraser Stores.
- (iv) A Profit Linked Share Plan.
- (v) A purpose built working environment with subsidised canteen and relaxation facilities.
- (vi) The opportunity of:
 - a. breaking into mini computers
 - b. working with a team of real enthusiasts
 - c. moving, with financial assistance, to the lovely countryside of Wiltshire
 - d. some travel throughout the U.K.

HOW TO APPLY

CONTACT: A.M. TASK FORCE LTD. OR Directly by Ringing Graeme Clarke
or David Batley
ON: 0783 41702, or write giving
details of career to:
David Batley
House of Fraser Computer Services
The Fraser Centre, Faraday Road
Dorcan Industrial Estate, Swindon
SN3 5HS

Computer Services Sales

Manchester - London and Home Counties - Southern England

c. £15,000

+Car+BUPA

the energy and talent to generate and negotiate new business contracts at the highest level.

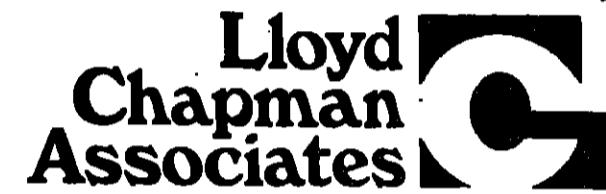
Successful applicants will have a thorough knowledge of computing facilities and an understanding of their application to a wide range of business requirements. They will be capable of working with and motivating high calibre technical support personnel.

The remuneration package offered is second to none with a high base salary, a generous commission scheme geared to realistic quota levels, free BUPA membership and a company car.

This is a real opportunity to join a company whose plans for success in the 1980s are based on a unique mixture of financial security, technological innovation and the continued adherence to a proven, successful business philosophy. For full information telephone Kevin McCourt or write with brief details quoting reference 3102. All applications will be acknowledged and treated in the strictest confidence.



123, New Bond Street, London W1Y 0HR 01-408 1670



FINANCIAL TERMINAL SYSTEMS

COLCHESTER - MANCHESTER

ANALYST / PROGRAMMERS

We require Analyst / Programmers to work within our Sub-Systems group involved with financial terminal systems. The successful applicants will be involved with the control of project writing, and vetting of specification programming estimating and scheduling. This will also involve the applicants in analysing and designing small to medium systems. We are looking for candidates with at least three years' experience in programming.

PROGRAMMERS

We are looking for Programmers at all levels to support our financial terminal systems and other equipment. Applicants should have at least one year's computer/commercial experience, and the Company will train the successful applicants in the use of its wide product range.

Programmers will be involved with the writing and testing of programs for office computer systems, small business systems and financial terminal systems.

In all positions, which are open to male and female candidates, Philips offer you the opportunity to widen your experience in the challenging environment of an expanding computer marketing company. Philips provide extensive in-company training facilities and excellent prospects for career progression over a wide range of products and in several software related activities. You will receive an excellent salary and conditions of employment, plus the security of working for part of the world-wide Philips Group. Generous relocation assistance will be given where necessary.

SYSTEMS ANALYSTS

(Benefit package includes car)

Philips Data Systems markets a comprehensive range of computers for business. A year ago the Division established the Sub-Systems software group, in order to market the Philips terminal systems products. During the course of the last year, the group acquired a number of major orders and in order to meet the requirements of our new clients, we are looking for Systems Analysts. Reporting to the Customer Support Manager, the successful applicants will be required to:

- * Analyse and specify the requirements of customers' systems.
- * Advise on systems performance where necessary.
- * Design systems for the financial terminal systems range of equipment.
- * Travel throughout the U.K. and Europe.

A minimum of two years' systems and programming experience, preferably with data communication knowledge, would be an advantage.



If you wish to know any more details, please telephone Colchester (0206) 8115, or write for an application form to: H. W. Hampton-Jones, Personnel Officer, Philips Data Systems, 11111, Harrow Road, Colchestr, Essex, UB4 8JL.

Software Design

Communications Development

Our client is a major manufacturer of a range of micro-processor based communications products. The creative aspects of these positions offer considerable opportunities to demonstrate flair and initiative.

Software Designer

The successful candidate will join a project team involved in the concept, design, development and implementation of software systems. Graduates, aged 26 or over, must have 5 years relevant experience, some of this being gained in software design of data communications and should also have a knowledge of basic network principles. Ref: 310/CW.

Systems Programmers to £7,500 Basic

Essential qualifications for this position are graduate status with 2/3 years programming experience covering ASSEMBLER or microcode. Experience in communications, whilst not being essential, would be a distinct advantage.

Ref: 311/CW.

On top of the basic salaries quoted, there is significant additional earnings potential in overtime and bonuses. Excellent employment conditions include generous relocation assistance.

Male or female candidates should apply for our confidential form quoting the appropriate reference number.

North West

to £10,000 Basic

Trainee Programmers c. £4,500 Basic

These positions will appeal to graduates with a relevant degree, ideally with 6 months work experience. Candidates must have the personality to succeed in a demanding, but exciting high technology environment. Ref: 312/CW.

24 Manchester Road,
Wilmslow,
Cheshire, SK9 1BG.

Telephone: (0625) 532446. (24 Hours).

**Wickland
Westcott
&Partners**

Management & Executive
Recruitment/Selection.

JOIN THE NEW GENERATION....2900 SERIES

With each new generation the demand increases for one of our most vital needs - water. North West Water handles the enormous task of supplying purified water and disposing of effluents for an area covering 5,500 square miles. At present, this means serving over 7 million domestic consumers and one of the largest industrial conurbations in Europe. Today, the demand for water has reached 500-600 million gallons a day - in 2001 it will be nearer 1000 million gallons a day.

Much of our success in this operation lies in a highly efficient data communications network, which we're currently updating with the latest ICL computer system available - the new generation 2900 series. Apart from administrative and financial applications - new management accounting, billing/belt recovery systems - we need to store vast amounts of data on rainfall, river flow, water quality and biology. Other applications include developing sophisticated models and reporting techniques to control daily operations and outline future plans.

Already we're augmenting our present system - 2 ICL 19045 machines using GEORGE 3 - by introducing a dual 2972 (6Mm) configuration, housed in a new purpose-built computer centre at our head office, in Warrington. Providing on-line processing facilities for each divisional office, it will have a back-up of 2903 remote processors and 7502 terminals and further mini computer link-ups to the main frame are being considered. As a result, this has created several exciting opportunities for experienced computer professionals to work in the following categories:-

1) Application Development

For the following posts, several years' experience in the relevant field is required, together with a working knowledge of COBOL or FORTRAN.

POST A: PROGRAMMING TEAM LEADER

POST B: SENIOR PROGRAMMERS

POST C: SENIOR ANALYSTS

2) Technical Support/Systems Software

You should have experience in at least two of the following fields:

ICL 1900 series, ICL 2900 series, large operating systems, mini-computers or communications.

POST D: TECHNICAL SUPPORT TEAM LEADER

POST E: 2900 PROJECT OFFICER

In each case you will, ideally, be young, intelligent, educated to degree level or equivalent and capable of working on your own initiative.

If so, we can offer excellent conditions of employment, including salary ranging from £5,421 - £7,886 (depending on age and experience) and generous fringe benefits, including relocation expenses if necessary.

Interested?

Then take up the challenge of an exciting career with great future prospects. For further information ring 082 672 4321, extension 36, or write for an application form to:

The Director of Personnel & Management Services, North West Water, Dawson House, Great Sankey, Warrington WA5 3LW.

The above posts are open to men and women.

**North
West
Water**

THE CONVERSION OF N.C.R.

A RECENT SUCCESS STORY

Experienced Salespeople £11,000 - £15,000

Salespeople Wanting to Sell £10,000 + Car

- Excellent Product Range
- Traditional Sales Techniques
- Superb Sales Training
- Corporate Financial Strength
- The Right People = SUCCESS

NCR needs Salespeople, to work in the London area. The range of products includes the 8200 through to the 8600 series of computers that is medium, large and very large mainframes and a wide range of terminals specific to different application areas.

Commercial and Industrial Systems opportunities exist for people with a business and computer systems background who wish to start a selling career. Higher level positions are available for people with sales experience and a proven selling record in the computer industry.

As we hear every day of doom and gloom it is encouraging to read a real success story. The change within a decade, of NCR from the sick man of the business equipment industry to a thriving dynamic company is vividly recounted in a recent article describing, "The Conversion of N.C.R.".

Consider these facts to place NCR in context -

TRADITIONALLY, the company marketed the first transistorised computer in the late 1950s, almost invented the art of professional selling, refined the use of training and played a major part in the application of mechanised information processing systems from cash registers and accounting machines to computers and terminals.

FINANCIALLY, NCR is one of the strongest companies in the EDP market. Profits and productivity have climbed dramatically in the past few years. R & D investment is growing and has already given birth to an enormous range of new equipment. The company forecasts a doubling of turnover by 1983.

"THE CONVERSION OF N.C.R." was published in Management Today, December 1979. A reprint of the article will be sent to all applicants - it provides background to the emergence of NCR to its present powerful position in the EDP market place.

Please telephone (24 hour answering service), write or return coupon to apply. Quire Ref: CW105-DJ

**CAPP
ASSOCIATES**
M: 686 9693

Computer and Professional Personnel Consultants
London and Manchester
AMP House, Ringway, Croydon CR9 2AU

NCR also has vacancies for good systems people who wish to sell and for computer salespeople with a good record with specialist knowledge of the automotive industry.

With the success of the MISSION package, the Industrial Team is being expanded and NCR needs people with a good production control background.

In the Retail field NCR wants people with a strong retail background to sell from point of sale terminals through to large mainframes.

However, unlike most success stories, you can do more than read about it - you can become an important part of the continuing progress of the company through the 1980s and beyond.

PRODUCTS, both hardware and software are formidably competitive. Complete migration is possible from the smallest 8100 series computer to the largest, mammoth 8670, using the same software and files. In the traditional NCR strengths of retailing and the financial sector, a tremendous diversity of terminal systems such as point of sale and banking "through the wall" equipment is available with many systems already installed. In industrial systems, MISSION is an extremely accomplished production package which has revolutionised NCR's own production control. Automotive industry systems are creating considerable impact in the E.E.C. If there is a speciality required then NCR often has the product - now.

PEOPLE, make the whole business success. The facilities are there, in new and traditional markets, with a range of hardware and software tools suited to the task.

The conversion of N.C.R. Please complete:
Name _____
Address _____
Postcode _____
Telephone _____
Date _____
Signature _____

How a phone call could earn you more than £250 p.w.

Contracts North and Midlands
Phone

Manchester 061-833 9341 (24 hrs)
Birmingham 021-643 8307 (24 hrs)

Programmers

IMMEDIATE STARTS!

c £250 per week North

Within easy reach of the beauties of the Lake District, there's a commercial giant with IBM hardware running under OS/VSI due to change to MVS later in the year. They need experienced COBOL and/or ASSEMBLER PROGRAMMERS like you to handle stock control, inventories etc. Six to twelve month contracts available starting now!

c £250 per week Midlands

Here's a unique opportunity to get into Micros. A commercial city based company want Realtime BASIC+ PROGRAMMERS like you to work on PDP11. The working conditions are nothing short of luxury and the immediate contract for 3 months is renewable.

c £250 per week Midlands

Have you got large 2900 and/or 1900 experience, ideally with GIII and VMEB knowledge? If so, then you've got what it takes for one of only 4 vacancies for our expanding client. You'll get an initial 4 month contract and a chance to start right away. Maximap experience advantageous.

SYSTEM 10 COBOL—Mids 12 mth c£260
BIG 2900 VMEB COBOL—Nth 3 mth c£250

2903 COBOL North East 6 mth c£250

2960 VMEB IDMS Yorkshire

7mth c£250

IBM 370 ASSEMBLER

(TOTAL) NW 6 mth. c£250

Immediate hotel accommodation will be arranged for successful short term applicants

For more information, an informal meeting or interview for CONTRACT vacancies
RING Manchester (24 hours) Birmingham (24 hours)

Knight Programming Support Ltd., Admaston House, Shambles Square, Manchester M4 1RE, and, Kensington House, Suffolk Street, Queensway, Birmingham B1

London·Manchester·Birmingham·Paris·Amsterdam·and New York

PHILIPS Simply years ahead for computer professionals...

To meet an ever increasing demand for systems development, particularly in the Commercial and Corporate sectors, ISA-UK are now able to offer the following opportunities in CROYDON and elsewhere.

ANALYSTS

to £10,000

Both Systems and Senior Systems Analysts are sought with upwards of two years analysis experience coupled with a mature personality and the ability to communicate with users at all levels.

ANALYST/PROGRAMMERS

to £8,500

Both Systems and Senior Systems Analysts are sought with upwards of two years analysis experience coupled with a mature personality and the ability to communicate with users at all levels.

PROGRAMMER

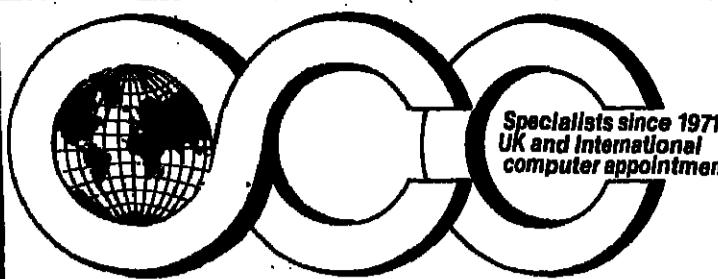
to £8,500

Both Systems and Senior Systems Analysts are sought with upwards of two years analysis experience coupled with a mature personality and the ability to communicate with users at all levels.

SCOPE

SCOPE PERSONNEL SERVICES LTD
Central House, 27 Park Street,
Croydon, CR0 1YD
Tel. 01 680 5920

Please forward Philips literature and application form to:
Phone No. _____
Day Tel. No. _____
Evening Tel. No. _____
Day Tel. No. _____
Evening Tel. No. _____
Ref. No. _____
Date _____



Specialists since 1971 in
UK and International
computer appointments.

We are staying open at our London office on the days and times shown above so that you can call in to discuss the employment opportunities that exist with our client.

Because we appreciate that taking an overseas contract can be a big step we would like to show and tell you about our client's organisation.

Our client will be interviewing in London on the 21-22 February and in April to recruit people for their organisation in Saudi Arabia.

THE PEOPLE REQUIRED

Systems Designers (Business Analysts) are needed for its Material Supply Section. Every year materials are handled with a value in excess of \$2 billion with movements of over 400 aircraft, 250 ships and 500 trucks, as well as 1.2 million square feet of warehouse space and 1000 acres of yard storage to control. Candidates should possess a degree or equivalent qualification and be experienced in developing major commercial systems. Hardware background is not important.

THE REWARDS

Contracts are on a single status basis and renewable. Air conditioned accommodation and free medical care are provided. In addition to an attractive base salary a bonus is paid on contract completion. Married personnel receive return leave every 4 months. Applications are invited from both men and women.

Telephone Mike Mead now, on 01-242 9356 (days) or 01-807 7425 (evenings) to find out more about these opportunities. Whilst it is not essential for you to come along to our informal interviews on February 14th and 15th, we would strongly urge you to take this opportunity to find out more about these exciting jobs.

If you are unable to come along or telephone, please write, quoting reference 912/CW, to:

London
OCC Computer Personnel, 16 Bedford Row, London WC1R 4EB.
Nantwich
OCC Computer Personnel, 4 Church Lane, Nantwich, Cheshire CW5 5RQ.



Systems Designers Business Analysts

£12k - £16.9k
per contract

**Informal Interviews
Thursday & Friday
14, 15 February
5.30pm to 7.30pm**

systems design opportunities

contracts for programmers and analysts

Computer People London

VLI Group

Contract assignments in the Northern Home Counties and London (all postal districts)

IBM

370 OS COBOL Analyst/Programmers
370 OS IMS COBOL Analyst/Programmers and Project Leader
370 OS IMS PL1 Programmers
30/32 MVS IMS COBOL Programmers with TSO

ICL

1900 PLAN/COBOL Analyst/Programmers
1900 GII PLAN Programmers
2960 EXEC MTS COBOL Analyst/Programmers
2960 VMEB COBOL Analyst/Programmers
2903 VMEB COBOL Programmers
System 1500 BTL ASSEMBLER Analyst/Programmers
System Ten Analyst/Programmers

OTHER REQUIREMENTS

PDP11 RSTS/E BASIC+ Programmers

PDP11 RSX11M MACRO 11/CORAL Programmers and Team Leaders

PDP11 RSX11M BASIC+2 Programmers

Univac 1100 EXEC 8 COBOL Programmers with DMS and structured programming experience

H6 TPS COBOL Programmers

H66 GCOS COBOL Programmers (IDS knowledge urgent)

H62 GCOS COBOL Programmers

IDMS Programmers

Project Leaders and Analysts for systems design using IMS

**Ring John Kelly or Barbara Wolski
on 01-836 8411 or mail the coupon**

Computer People South

VLI Group

Contract assignments in the Southern Home Counties and the South West of England

IBM

370 OS COBOL Programmers
370 OS IMS COBOL Programmers
370 OS IMS PL1 Programmers
370 DOS COBOL Programmers

OTHER REQUIREMENTS

PDP11 RSTS/E DIBOL Programmers (with systems exp.)

PDP11 RTL2 Analyst/Programmers and Programmers

DG RDOS Business Basic Programmers

If you are interested in any of these contracts, and have at least two years' experience as a programmer or analyst, we would like to hear from you.

Please provide information about contract assignments.

London

South

Name _____

Tel.Nos. _____

(Day) _____

(Ev/Wkd.) _____

Mail (no stamp) to FREEPOST, VLI House, London WC2N 4BR

COMPUTER OPPORTUNITIES IN SCOTLAND

...so anyone with 12 months of experience, please come home'

SYSTEMS ANALYSTS, JUNIOR ANALYSTS PROGRAMMING PROJECT LEADERS PROGRAMMERS

Recent, a leading Commercial organisation require D.P. professionals to join their growing team at their headquarters in Central Scotland.

THE JOB:

BUSINESS ANALYSTS

London: To aid the user departments in the solution of their business problems and give the necessary data processing service

Experience: At the senior level candidates should be educated to degree standard or equivalent, have at least three years' systems analysis experience and a general grounding in a commercial environment (e.g. O & M, Accountancy). A number of Junior Analyst posts are also available with the same educational requirements but with less practical experience.

Salaries: £6,800 to c. £7,600 + Benefits.

PROGRAMMING PROJECT LEADERS

London: To lead a team of programmers engaged in computer system design and program development

Experience: A practical knowledge of COBOL and ASSEMBLER. Systems Design and Project Control. An IBM mainframe background is essential

Salaries: c. £7,600 + Benefits.

PROGRAMMERS

London: To be part of a team responsible for the writing and implementation of COBOL/ASSEMBLER programs

Experience: At least two years' practical COBOL and ASSEMBLER.

Salaries: c. £6,200 + Benefits.

COMPANY BENEFITS INCLUDE:

Reduced Mortgage Facility

Non Contributory Pension

Relocation Assistance

Offices located in rural areas with excellent recreation facilities yet within easy reach of major centres.

Telephone: 031-226 5909 to arrange an interview or write including details of C.V. to:

**DML COMPUTER PERSONNEL SERVICES
11 CHARLOTTE SQUARE
EDINBURGH EH2 4DR**

AS in most other regions, demand for staff in Scotland still far exceeds supply, although there has been a marked improvement in the availability of trainees and experienced staff.

The increase in the number of trainees has been improved primarily because of the increased availability of related degree courses, the advent of government retraining schemes and a new awareness by the user that future analysts and programmers can be found from disciplines other than maths or computing.

It seems that the supply of experienced staff in Scotland has exploded recently. Many expatriates who have gained their experience "abroad" are more than keen to give their expertise back to the Scottish user. In some cases this relocation of experience is a great asset. Not forgetting of course that there still remains keen competition from the local groupings of experienced staff in Scotland.

In fact the cry of the Scottish user looking for staff at present must be, "We have the experience, we have the benefits (yes, you guessed), we even have the technology, so anyone with 12 months' experience, please come home, or try life in Scotland."

Humour aside there is a real opportunity for the recently-skilled analyst or programmer to move to Scotland and gain invaluable experience. The candidate can choose from the big IBM mainframe installation with a heavy emphasis on commercial applications, the large manufacturing concern with production control systems, or one of the many other components of the efficient D.P.-oriented industrial combines.

For the technically minded Scotland is a real haven. Numerous computer and peripheral manufacturers have plants in Scotland and there is a constant demand for quality staff at all levels. Within the large installations, with the advent of new machines and more advanced software, the demand for technical staff has been increased.

The openings exist for the candidate with one to four years' experience, so why should you move over the border? No doubt most readers of the appointments pages in Computer Weekly often read of the improved quality of life in Scotland and there is a real increase in the numbers of computer staff discovering the reality of such statements.

However, in an article on world computing in Scotland it was noted that there is more to life in Scotland than just the weather. Naturally, there is more to life in Scotland than just the weather. The people of Scotland are known for their friendliness and hospitality.

by Philip Bliss
of DML Computer Personnel
of Edinburgh

one nonetheless, therefore a preliminary interview is essential to find your bearings and discover not just the right job but the right locality and company.

If I may quote a competitor of mine from the recruitment community, "Nobody can afford smarmers these days." This applies as much to the prospective employer as to the potential candidate.

Nobody wants to travel to Scotland half a dozen times to find the job to suit them. Candidates should make sure they use their agency to the full and should have trust in the ability of the consultant handling them. The client should also have more than just a few details on a bit of paper before spending substantial sums on interview expenses.

SYSTEMS ANALYST

£8,000+. EDINBURGH: Handle number of projects. 2-3 years' programming experience. Knowledge of microsystems advantageous. Profit-sharing scheme. Assisted mortgage.

SENIOR APPOINTMENTS COMPANY: 041-204 1887.

ANALYST/ PROGRAMMERS

UP TO £8,000. EDINBURGH AREA: Deal with new systems. Maintain old systems. High-low level languages. Commercial systems. Large National company.

SENIOR APPOINTMENTS COMPANY: 041-204 1887.

SENIOR ANALYST

£10,000. GLASGOW CITY CENTRE: Major consultancy status. Initiative essential for control of own projects.

SENIOR APPOINTMENTS COMPANY: 041-204 1887.

PROGRAMMER

£6,000. GLASGOW CITY CENTRE: Commercial and accounting applications. Staff discounts. Flexi-time.

SENIOR APPOINTMENTS COMPANY: 041-204 1887.

SENIOR APPOINTMENTS COMPANY: 82 UNION STREET, GLASGOW



COBOL PROGRAMMERS

Aberdeenshire Council is prominent in the field of production, platform, manufacturing and ancillary equipment for the oil and gas industry. Our 850 acre site near Inverness is the showplace of future fabrication facilities.

Our installation computers, an IBM 370/125 (OS/VS, F/VSAM) with a TP link to an IBM 370/138 in Brussels, Belgium is to be upgraded to a 4341.

Various engineering and commercial applications are under development, many of which may utilise COBOL.

Our Development Section require additional programming staff. Preferably educated to 1st level with a minimum of 2 years COBOL experience, ideally in DCS/V3. Environment similar to the above.

Additional experience in Structured Programming and Tele-processing techniques would be an advantage, although training will be provided if required.

Specialist applications would include our Development Team as Programmers, but would be assigned to various projects and to support existing facilities within the team.

A competitive salary is offered and other staff benefits such as Pension Scheme, Sick Scheme, and Training Scheme. All are indicative of the opportunities placed on these positions. A generous and well-structured induction programme is available.

You are interested in the permanent position and would like further details, please write or telephone:

Mr. D. B. Smith, Manager, Aberdeen Section, P.O. Box 8, Aberdeen, SCOTLAND.

Telephone: 041-3124281.

1/1/80

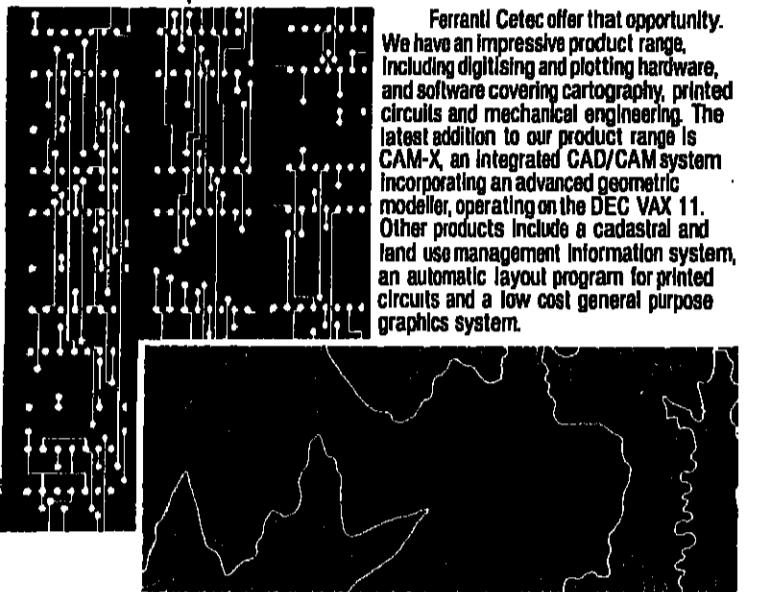


COMPUTER OPPORTUNITIES IN SCOTLAND

Graphics Software

Applications Programmers

Computer Graphics is becoming the most important opportunity area for applications oriented software designers. Here in the UK we have some of the best designers in the world, but, because of the fragmented nature of the UK computer graphics activity, many of these designers are frustrated by lack of opportunity to move ahead.



Ferranti Cetec offer that opportunity. We have an impressive product range, including digitising and plotting hardware, and software covering cartography, printed circuits and mechanical engineering. The latest addition to our product range is CAM-X, an integrated CAD/CAM system incorporating an advanced geometric modeller, operating on the DEC VAX 11. Other products include a cadastral and land use management information system, an automatic layout program for printed circuits and a low cost general purpose graphics system.

Ferranti Cetec are growing fast and in the early summer will be moving into new specially designed accommodation in Livingston New Town where our neighbours will include DEC, Tektronix, Burroughs and Marconi. As part of the Ferranti organisation, we are backed by the resources of one of the most important advanced technology companies in the country—as a specialist company within that organisation, we have our own identity and objectives, and depend for our success on our own abilities.

We are looking for applications programmers with experience of graphics in mechanical or electrical engineering or in cartography to get in on the ground floor of our expansion. By contributing your expertise now, you will make your mark on probably the most important graphics projects in the country.

We can offer you a very attractive employment, career and job satisfaction package. If you can offer us the professional skills we are looking for, together with the personal qualities needed to make an effective responsible contribution in a rapidly growing organisation—take the first move to join the Specialists. Write with brief personal and career details or telephone for further information to:

Ernest Barnard,
Ferranti Cetec Graphics Limited,
Queen Elizabeth Avenue, Glasgow G52 4SN
Tel: 041-882 3384

FERRANTI CETEC

Specialists in Computer Graphics

COMPUTER WEEKLY CLASSIFIED

01 261 8028/8097/8019

the newspaper computer people rely on

Graphics Software

Applications Programmers

Software Engineer There's something brewing in process control

At Scottish & Newcastle Breweries Limited we have been making major advancement in process control with Intel Microprocessors supported by two M.D.S. Intellic Systems.

The scale of our brewing operation—4 major brewing centres in Edinburgh, Newcastle and Manchester producing large volumes of our McEwans, Youngers, Newcastle and Harp ale and lagers—presents massive scope for plant systems development.

Taking up this challenge is our Group Automation Team of electronics, automation and software engineers operating from Edinburgh.

To strengthen this team we require a Senior Software Engineer who will specialise in software design and maintenance using high and low level languages.

Scottish & Newcastle Breweries Ltd.



You should be innovative, hold a degree or HND in computing science or allied subjects with programming experience and an understanding of computers gained in a Scientific or Engineering environment.

The job's rewards will include a salary of around £7,500, excellent non-contributory pension and life assurance scheme, free beer allowance, generous hotel concessions and substantial assistance with re-location costs where applicable.

If you are interested, please telephone Miss Elaine Haldane on 031-558 2591 ext. 4748 and ask for an application form, or, write to:—Recruitment Department, Scottish & Newcastle Breweries Ltd., 160 Canongate, Edinburgh EH8 8DD.



It's all systems go at Hambro Life!

Computer systems are central to Hambro Life's phenomenal growth. In less than 9 years we've become the UK's biggest life office specialising in unit-linked assurance. (Assets now exceed £860 million and our business grew by 32% last year!) Such a rate of growth has been made possible only by the most imaginative use of computerised systems to speed up new product introduction, cut down policy processing time, and create an exceptionally fast and efficient administration. Our current computer systems have served us well but accelerating growth means making large-scale changes to all our major systems, including the development of a completely new life system which alone will take some 80 man years' effort. These developments depend heavily on new technology - including data base, on-line systems and word processing. Our next generation of systems is producing an exciting work load and opportunities for rewarding, personal growth at the centre of one of the UK's most successful companies.

SENIOR SYSTEMS CONSULTANTS TO £13,200 + CAR CONSULTANTS TO £11,500 + CAR

These jobs put you firmly in the front line of our business management, sharing responsibility for wide-ranging business decisions. To qualify you need to be that rare breed of analyst; part consultant, part entrepreneur but above all a practical problem solver.

The ideal candidate should be a graduate and under 35; excel in all the systems skills; have at least 5 years' large scale systems experience, including a proven record of successful implementations; be currently active in consultancy or project

leading; be eager to make a major contribution quickly, and progress within the Company.

SENIOR CONTROLS CONSULTANT TO £13,200 + CAR

We place great emphasis on the importance of Controls in systems development. In 1980 we want to extend the role of our Controls group to cover all data processing controls, and we need an experienced Controls professional to head up this new group. General requirements are as for the previous jobs but also include a comprehensive knowledge of Controls theory, technique and successful implementation.

SYSTEMS ANALYSTS TO £10,600

We need Analysts in search of the experience and rewards to match their potential. Ideally you should be a graduate, under 30, and have at least 2 years' systems experience, including at least one successful major systems implementation. Essential personal qualities include enthusiasm, confidence and the personality to succeed, the drive and stamina to implement projects within tight deadlines, and not least, the ability to quickly progress to the more senior jobs.

Realistic salary levels are just one aspect of a whole Company philosophy which you'll find refreshingly different. We're young, businesslike and work hard to high standards. We give as much responsibility as you can take and recognise achievement with real rewards.

Our remuneration package is first class - with non-contributory pension, free life cover, BUPA, productivity bonus, profit sharing, and generous assistance with moving to Wiltshire (including the guarantee of a mortgage).

For our comprehensive booklet and an application form, contact:

Liz Gibney, Hambro Life Assurance Limited,
Hambro Life House, Swindon SN1 1EL.

(Telephone 0793-27812 24-hr answering service - reverse charges during office hours.)

Our Senior systems people will be pleased to meet you informally and talk shop at any time between 1 pm and 9 pm at our open days:-

Manchester

Portland Hotel, Piccadilly Gardens, Monday 18 February.

Birmingham

Holiday Inn, ATV Centre, Monday 25 February.

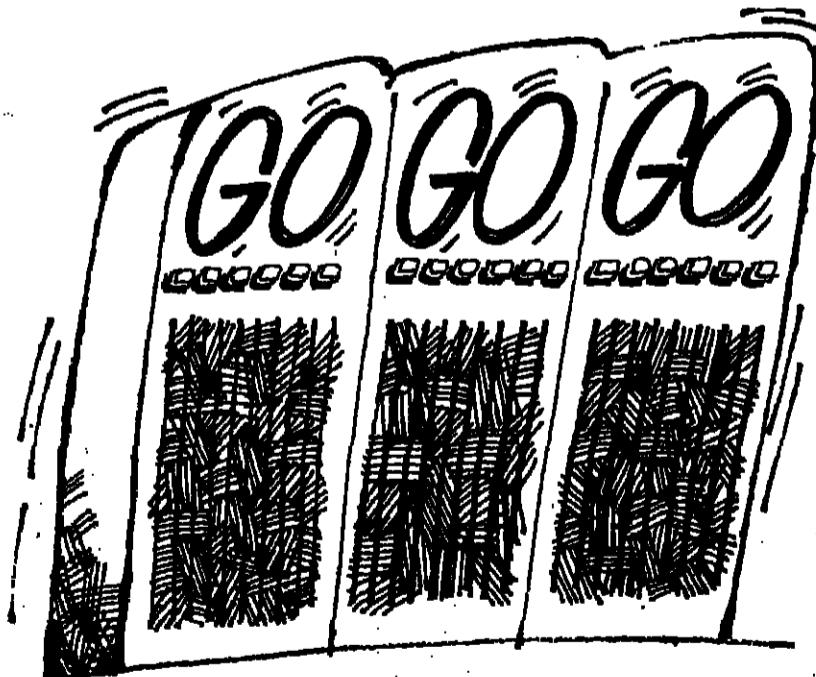
London

Cumberland Hotel, Marble Arch, Tuesday 26 February.

Bristol

Holiday Inn, Lower Castle Street, Monday 3 March.

We look forward to seeing or hearing from you.



Hambro Life Assurance Limited
Hambro Life House Station Road Swindon SN1 1EL.

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Have you:

- sound commercial acumen
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- project management experience or potential

SYSTEMS ANALYST to £9k - A4/M4 Berkshire

Our client is seeking a person with good business know-how and well-developed communication skills who can gain the confidence of line managers and users and work with them to develop and implement practical systems. You do not need to have any specific hardware background although the ideal candidate will probably, at some time have worked with IBM 360/370 equipment.

You may currently be a business analyst seeking greater scope and responsibility for total projects from start to completion. On the other hand you may be a systems analyst wishing to move away from pure D.P. to a more corporate role.

Whatever your present function, if you have a thorough understanding of what makes a company tick, this could be the opportunity you have been waiting for.

For more information contact Jack Collings at his office from 9 a.m.-5 p.m. on 0273-833848, or if you prefer, speak to him any evening (including weekends) at home after 7 p.m. on 0273-400880. Failing that, just simply send in your career resume and we will get back to you.

INTERVIEWS CAN BE ARRANGED LOCALLY, DURING EVENINGS OR WEEKENDS IF NECESSARY

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Our client offers an unrivalled opportunity for experienced and aspiring Project Managers to test their mettle on a range of very challenging assignments that encompass the development of a large, trans-continental network system during the early 1980s.

Most important aspects are proven commercial experience coupled with strong management skills. Career prospects are excellent with a company deeply committed to computing. If you feel ready to contribute to 'state of the art' technology then contact us for more details. The advising consultant is JACK COLLINGS who can be reached during the day on 0273-833848 or after 7 p.m. any evening (including weekends) on 0273-400880. If you prefer send him your C.V.

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ANALYST/PROGRAMMERS

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One of the top consulting companies in America. We have very recently opened our London office and are looking at most levels in system application programming, games design and teleprocessing.

Clients include banks, insurance, commercial and industrial companies. The work is interesting, varied offering on-going training, career development and the option of 6 month transfers to one of our U.S. offices.

Arrange an interview (expenses free) by enclosing your c.v. or telephone Roger Barnes at:

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THE UNIVERSITY OF MANCHESTER

There is a vacancy in the Department of Computer Science for a

PROGRAMMER

to assist a small research group in the automation (including use of interactive graphics) of printed circuit board design, digital circuit simulation and microelectronic system design. Experience in the maintenance, documentation and development of computer software is required. Qualification ONC in HNC or equivalent standard.

Salary within the range £3,776-£4,822 p.a.

Applications with full details of age, qualifications and experience should be sent to the Laboratory Superintendent, Department of Computer Science, The University, Oxford Road, Manchester M13 9PL.

LOUGHBOROUGH UNIVERSITY OF TECHNOLOGY

ENGINEERING LECTURESHIP

Applications are invited for a LEC TUTORSHIP in the Department of Engineering Practice from graduates with extensive practical industrial and/or research experience particularly in the manufacturing industry. Specific areas of interest include:

Computer aided manufacture

Computer aided design

Production management

Quality engineering

Manufacturing systems

Salary within scale £8002-£10,494

Grade 7, 37 hours per week. Further details and application form from Paul Johnson, Establishment Officer, LEC, B17/8 EN, Loughborough, Leicestershire.

SCHOOL OF ELECTRONIC SYSTEM DESIGN

(Approved MAPCON consultants)

MICROPROCESSORS AND THEIR PERIPHERALS

Short Course, March 10th-14th inclusive.

The course, which is DDI (MAP) supported, covers the Z80 and 8080/85 microprocessors, together with a number of associated peripheral devices. Great emphasis will be placed on practical work with both afternoon and evening laboratory sessions.

Write for a brochure and application form to: The Short Courses Office, Westfield Institute of Technology, Bedford MK44 0AL. Tel: 0234 780111 Ext. 284, or ring Mike Davies, Ext. 3107/3108.

ANALYST/ANALYST PROGRAMMER

£8000-£22500 p.a. £80k ex.

To help, design and develop new systems at our well-known Electrical and Electronic Company at HAINAUT.

Please hear more on 01-409 1021
JUST LISTEN, YOU DO NOT NEED TO SPEAK

NATIONAL WATER COUNCIL

Computer Development Officer £8179-9589

Come and break new ground for the water industry

The National Water Council requires a Computer Development Officer to implement a range of new computer-based projects at its London headquarters. The Council co-ordinates the policies of the water industry in England and Wales, covering conservation, supply, sewage, pollution control, recreation and fisheries.

We are currently operating a CTL Module 1 computer which is due to be replaced by two 0.5 Mb 8036 machines in July. In addition to developing a number of accounting systems, future work will include overseas loan, productivity monitoring and accident information systems.

You will be involved in developing office and accounting systems, and database applications, as well as providing expertise in systems programming and operations control.

You should have a good academic background and be able to communicate confidently with people at all levels. Ideally, you should have broad programming experience with specialist knowledge of FORTRAN and an assembler language. You must also be able to get to grips with the CTL Modus operating system - a knowledge of CTL equipment would be an advantage - and be willing to participate in the whole spectrum of computing.

Starting salary will be according to qualification and experience. An attractive range of benefits include 22 days annual holiday, a contributory pension scheme, personal accident insurance scheme and luncheon vouchers.

Please write for an application form to: Mr. R.H. Pamplin, Assistant Secretary (Establishments), National Water Council, 1 Queen Anne's Gate, London SW1H 9BT.

CLASSIFIED COPY

All classified copy should reach our office no later than 3.30 p.m. on the Monday preceding Thursday's publication.
If completed artwork is supplied, 11 a.m. on a Tuesday.

Ring Rev. Kelly for further details on 01-261 8016.

Software Designers & Programmers

Looking for a new challenge?

At Marconi Avionics we are involved in a major programme of work on the development and manufacture of sophisticated digital signal processing equipment having a wide range of applications, particularly in the field of military radars and sonar.

Increasing use is being made of mini-computers and microprocessors and we are now looking for additional Software Designers and Programmers to join our team and work on a variety of technologically demanding projects calling for a highly professional and innovative approach to software design.

The work is challenging, the environment stimulating and the salaries and benefits highly competitive. Training will be given as necessary.

There are excellent future career prospects within the Company at both the Borehamwood, and Welwyn Garden City sites which is expanding fast.

Assistance with local authority housing could, in certain circumstances, be made available. For further details ring us now on 01-953 2030 extn 3156 or write to Tony Elliott.

Marconi Avionics Limited, Elstree Way, Borehamwood, Herts WD6 3RX. Alternatively telephone 01-207 3455 anytime.

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Clinical Physics and Bio-Engineering Department

Required for design and construction of prototype circuits and the testing, calibration and repair of clinical electronic equipment situated in modern hospitals in South Essex. Full City and Guilds Certificate or equivalent with approximately three years' electronic experience.

Salary £4805 per annum, annual increments to £5952 per annum.

PHYSICIST/COMPUTER SCIENTIST (BASIC GRADE)

For software development and maintenance and system development mainly concerned with clinical applications in nuclear medicine and radiotherapy. The successful applicant will be expected to assist in all clinical / scientific applications of computing.

A knowledge of Fortran and BCPL is essential.

Applications will be considered from students expecting to obtain honours degrees this year in Computer Science or related subjects.

Salary: £4464. £6075 per annum.

Application Form/Job description available from District Personnel Department, Southend Hospital, Southend-on-Sea (0702) 48811, Extension 423.

SYSTEMS ANALYST

c. £7,000

E. Gomme Limited, manufacturers of G-Plan furniture at three locations in the United Kingdom, require a Systems Analyst to join the small friendly data processing team at the High Wycombe headquarters, where we use an IBM 370/126 to process a wide range of applications.

Applicants should ideally be aged between 25 and 35, with a programming background and two years' systems experience. We can offer you an important role in the design, implementation and maintenance of a wide variety of both batch and T.P. applications.

The Company offers excellent conditions of service and a salary will be negotiable in the region of £7,000. Generous assistance with relocation expenses will be given, where appropriate.

Write to:

A. Sampson
Company Personnel Manager
E. Gomme Limited
Spring Gardens, High Wycombe, Bucks.

Cambridge City Council Systems Analyst

(Salary up to £6,090, with Comparability Award pending)

To join a small team within the City Treasurer's Department, The Council operates an ICL 2904 with EDS 80's and two 7502's serving enquiries and ICL's new Counter Terminal System.

The main development in the next two years will be a Management Information System running under Database Management Software. Further information is obtainable from the Computer Manager, D. Smith (0223-358977 Ext. 284).

Relocation and assistance with housing accommodation are allowed in approved cases. Other benefits include flexible and staff restaurant. Applications giving full details of experience and qualifications and naming two referees must reach the underlined by Monday, 18th February, 1980.

City Treasurer, Guild Hall, Cambridge CB2 3QJ

PRIME COMPUTER-R and D BEDFORDSHIRE

Our tremendous growth rate - we're one of the fastest expanding computer companies in the world - puts a sharp focus on our R&D initiative to supply the progressive technology to meet the accelerating demands of commerce, industry and science.

A key link in Prime's world-wide research and

engineering development organisation, The Merton Centre has a number of highly advanced products under development which call for a significant expansion this year. This now creates exceptional career openings for energetic, enthusiastic and creative computer professionals.

Technical Authors

The two authors will work with a major new project team developing a transaction processing system for commercial business applications. The system is designed to be used by clerks, while the business transactions themselves may be built by analysts, administrators and programmers.

You will be involved in the preparation of both manuals and brochures and also of on-line dialogues and 'help' texts for inclusion in the system. Three years' relevant experience is essential.

Salaries are highly competitive, and conditions of employment are excellent, with a good pension scheme, plus free BUPA, life assurance, company stock purchase scheme and very pleasant rural location. Scope for progression is considerable.

A range of personnel, from senior level down, are needed to work on product developments involving advanced networking and communications products, transaction processing systems, or system back-up facilities. All project stages will be covered, from specification and design through to documentation.

These are excellent opportunities for men and women with a background of 4-6 years in the development of operating, T.P. or database systems, compilers, programme generators or communications/networking products for mini or mainframe computers.

For further details, contact Mrs Debbie Teague immediately on 0234 65121. Or write to her at Prime Computer (UK) Limited, The Merton Centre, St. Peter's Street, Bedford MK40 2PN.

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- Not less than £8,000 p.a.
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Cam Gears is the leading supplier of steering components in Europe. With a turnover exceeding £60m and an impressive profit record it offers stability and excellent career growth prospects.

Current computing equipment consists of ICL 2903's and an ICL 2904 serving the five UK factories. However, plans are in hand to centralise computing at Hitchin with the introduction of an ICL 2905 and a network of 7502's, for on line and data entry systems.

A manager is required to take responsibility for the Hitchin installation and to provide a computing service to the local and remote users.

You should have previous experience in a similar position and the maturity to gain the respect of senior user management. Technical competence should be strong and if this includes data communications, so much the better.

The company will offer a salary level to attract the right candidate, all overtime will be paid at premium rates and there are other benefits including the payment of relocation costs in appropriate cases.

Please call Mary Stone to discuss this opportunity in confidence.

CHELSEA COLLEGE University of London SYSTEMS PROGRAMMER

A Systems Programmer is required to join a small group maintaining the VULCAN operating system and its languages and utilities on a Harris 5125 computer. The post calls for an experienced assembler and Fortran programmer, working in an organised way with particular emphasis on documentation. Salary scale: £4893-£7731 per annum (inclusive of £740 per annum London Allowance). Commencing salary will depend on age, qualifications and experience.

Further details and application forms from the Personnel Officer, Chelsea College, Chelsea Manor Street, London SW3 3TW. Informal contact can be made with the Manager of the Computing Centre 01-736 1244. Closing date 26th February 1980.

Applicants should ideally be aged between 25 and 35, with a programming background and two years' systems experience. We can offer you an important role in the design, implementation and maintenance of a wide variety of both batch and T.P. applications.

The Company offers excellent conditions of service and a salary will be negotiable in the region of £7,000. Generous assistance with relocation expenses will be given, where appropriate.

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Company Personnel Manager
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**The way you mean to go on!
WINNING!**

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Fill in the endorsed application form**

SYSTEMS ANALYST — NORTH WEST

EMS require a further large number of experienced Systems Analysts to work with our consultative teams developing large commercially oriented systems for the North West. Experience in the design and implementation of at least 2 major systems is required, coupled with a previous duration of programming involvement. We envisage all candidates having worked on a successful implementation of at least 2 major systems during their career. Equally, you should have the experience to communicate effectively with a wide variety of users and to competently design appropriate application facilities to user specifications, presenting drafts for approval at all stages. Near, accurate specifications will be required down to programmer level, clearly giving programmers the optimum information for easy compilation.

Particular experience in Accounting, Data Processing, Payroll and general commercial systems is required. Candidates should preferably be educated to a minimum 'A' level standard, whilst preference is given to those with HNC/ND or degree.

Sound career opportunities exist for consultants wishing to transfer later to our Turnkey Division installing mini computer based systems, or to continue with both our national and international consulting division activities.

For early UK interviews please phone urgently today for an application form:

Tony Kite — 021-454 7906
John Wood — 0782 623665

PACKAGE SYSTEMS DESIGNERS — BIRMINGHAM

Our recently opened Data Centre, concentrating primarily on Turnkey Systems Development based on Honeywell Level 6 and D.G. hardware, has ongoing requirements for senior experienced Systems Designers with relevant mini experience, capable of controlling and co-ordinating team development on package design. We particularly seek Systems Designers who have previously worked on the design and development of Packages such as Ledger, Payroll, Sales Order Processing, Stock and Production Systems. All packages will be designed primarily as part of a total system.

Particular experience in mini systems design is required, with a good knowledge of assembly language and experience of working on mini systems. Good communication skills are essential.

We are looking for experienced systems designers with a wide range of facilities, committed to assisting future software development for a growing and diverse range of manufacturing and distribution systems. The Company capitalises on making a major contribution towards both current and future development plans. Significant scope for career progression for candidates of sufficient calibre. Able to make an early and positive contribution towards group development.

Reply to Ian Gapper — 021-454 7906

SYSTEMS DESIGNER ICL 2904 BASED SYSTEMS

The EMS ICL Systems Division based in Newcastle under Lyme Centre have an urgent requirement for an experienced Systems Designer to work in a small team of analysts and programmers to take responsibility for feasibility studies, systems analysis and design for a variety of projects and regular communication with the client through to systems testing, implementation and maintenance. The position is systems based and has only been established in the last few years. The job will be undertaken in a team environment with the emphasis on systems design and development. The position offers an excellent opportunity for career progression and advancement. We are looking for candidates who are considerably ahead of projected targets and envisage a successful development during the 1980s. Work varies from many original custom-built projects through eventually to converting a variety of established systems from our Mini and Turnkey development unit based in Birmingham for use on ICL 2904/7 and coming new range systems. An attractive salary will be negotiable according to the level of experience available with each candidate.

Consultant — Dan Wallgate — 0782 623665

MINI SYSTEMS DESIGNERS

LONDON & HOME COUNTIES

A large range of Mini users throughout the southern region have urgent requirements for experienced staff to undertake a wide and diverse series of development projects during early 1980. Clients include original manufacturers engaged upon specific product development to market through their own client base. Turnkey systems groups developing applicative systems on behalf of clients, major trading organisations developing their own in-house systems on behalf of a significant series of users through to software organisations developing products for onward promotion throughout the Mini user base. Excellent career opportunities exist with a guarantee wide range of job interest. Salaries will be very attractive for experienced staff and merit a few minutes involved in completing the enclosed EMS application form. Each candidate applying will be assured of a significant range of interview opportunities.

Consultant — John Wood — 0782 623665

TOP SALARY NEGOTIABLE

£7,000 to £10,000

UP TO £10,000

NUEROUS APPOINTMENTS THROUGHOUT UK

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